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MEDICAL JOURNAL.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Refracture for the Relief of Deformity following Badly-treated Fracture of the Extremities.* Illustrated by Cases Treated in the Pennsylvania Hospital. By JOHN B. ROBERTS, M.D., of Philadelphia, United States.

History.—The tendency of the surgery of the present day seems to be towards conservatism in recent traumatic cases, and towards more active operative treatment in chronic surgical maladies and deformities than was formerly considered justifiable. The advance in the latter direction is well shown by the present mode of dealing with deformities, the result of untreated or badly managed fractures; for it is only within the present century that surgeons have been agreed upon the propriety of operative interference in such cases. The idea of rupturing the callus in order to relieve deformity is by no means new, for Hippocrates, Celsus,[1] Galen,[2] Paulus Ægineta, and Avicenna discuss the matter as a resource of surgery to be employed in those instances where the degree of deformity is sufficient to demand treatment. The opinion of many succeeding writers was decidedly adverse to the measure, and Fabricius Hildanus, Paré, Petit, and Heister,[3] either reject it altogether, or allow its employment only in the early stages of fracture. During the first half of the present century a good deal of attention was directed to the subject by Oesterlen, Jacquemin, and others; since which time the frequent adoption of refracture of deformed callus in malunion has shown very clearly that the fears of earlier authorities were to a great extent unfounded, and that, not only is there very little danger in the procedure, but that good results generally follow in regard to correction of the condition of deformity.

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[1] Lib. viii. cap. 10.

[2] *Ars Medicinalis*, cap. xciii.

[3] *System of Surgery*, p. 117, London, 1743.

Notwithstanding the change of opinion just mentioned, there still lingers with many an impression that these cases of deformity should be let alone, and that the surgeon should refuse to undertake any remedial operation. It seems strange that this idea should be retained, when every one has seen what little trouble is experienced by patients who fall and fracture a bone a second time in the same place. Many cases of deformity treated successfully by refracture have been recorded; but perhaps the timidity of some may be overcome by the relation of a few cases which have come under my notice during the last few years in the wards of the Pennsylvania Hospital at Philadelphia. Some of these were under my direct observation as to after-treatment while I was serving as resident surgeon in the institution.

Methods of Treating Deformity from Fracture.—Refracture, or rupture of the callus, is only one of the methods of dealing with the deformity, but it combines the advantages of being available in a large majority of cases, and of being attended with a minimum risk. Gradual extension and pressure at the seat of deformity has been employed, but, as is easily seen, this will be of service only at the earliest stages of solidification, and in truth should constitute the treatment of the fracture from the very start, if there is tendency to angular displacement or overlapping. When cases present themselves for the relief of distorted limbs the union is too firm to be affected by any such method as this, which can only mould soft or semisolid callus.

In addition to pressure and extension, tenotomy may not unfrequently be of service in the early weeks of fracture, by weakening the power of displacing muscles upon the broken fragments. It may also be needed as an assistant to refracture, when the surgeon chooses that method of managing the troublesome bones; but of itself it is, of course, valueless in meeting any deformity dependent on deposition of callus.

By the term refracture, I mean causing a separation of the fragments at the original site, which may be done by the application of external force alone, or by introducing, as a preparatory step, a perforator to weaken the union due to the large mass of callus usually deposited about fractures when the apposition is not good. The latter method makes, in many instances, a compound fracture, but still comes under the appellation of a subcutaneous operation. I see no reason why a narrow saw or a chain saw might not be introduced in the same way, and subcutaneous osteotomy done, as in cases of anchylosis; but I do not know that this method has been used to any extent in separating badly consolidated fractures.[1]

The more serious operations, such as excision of the ends of the displaced fragments and amputations of the limb, which may occasionally be adopted in instances of very great deformity and inability to use the extremity, must be very seldom justifiable, and should only be employed when other means have failed. With these procedures the present paper has nothing to do, but shall be restricted to the consideration of refracture as described above.

Proper Cases for Refracture.—The first question in regard to this operation that must be discussed is—What are proper cases to be subjected to refracture? This query can only be answered by investigating the matter in these directions, viz., the amount and character of deformity that demands operative measures, the locality of the original fracture, and the length of time after the primary injury that refracture of the malunion can be accomplished. By far the most frequent reason for having recourse to this operation is shortening of the lower limbs, preventing to a greater or less extent locomotion. A large protuberance of callus situated upon the femur or tibia would be a matter of little moment if the patient had perfect power of progression; but it is because this mass of callus is present, as a result of overlapping or angularity of the fragments, both of which circumstances cause shortening of the extremity, that the case calls for surgical attention. There is, of course, no algebraic formula to tell us how much shortening shall be considered equivalent to an operation; and it is well known that a considerable amount of shortening, at times nearly an inch, exists without inconvenience in many persons with uninjured legs.[2] The most favourable cases for operation are those where, on account of imperfect treatment, the fragments have united at their extremities, but not in the same line, and thus cause angular deformity and consequent shortening. The union in such instances is more readily ruptured, because the surfaces united are somewhat limited in extent, and the angularity of their position gives a good opportunity for disruption, by applying pressure at the salient angle. In addition to being more amenable to separation, it is evident that the prevention of a recurrence of the deformity is more easily met by after-treatment than if the distortion was dependent upon overriding of oblique smooth surfaces. Such cases, then, are eminently proper ones for treatment by refracture. Shortening, resulting from lateral apposition of the cylinders of bone, caused by want of attention to overcoming muscular displacement during the original treatment of the fracture, appertains to many cases; and such cases have by some been considered unsuitable for operative interference. They, however, believed that in these cases the bond of union, though firm enough to support the weight of the body in walking, was, at least for a long time, fibro-osseous in its nature, and therefore could be successfully ruptured.[1] In attempting to dissever the fragments in instances of this nature, the force should, of course, be applied in a manner to bring transverse strain upon this uniting bond. If the bones are opposed with anterior surface to posterior surface, the power should be exerted laterally; if side to side, the surgeon must use his force in an antero-posterior direction. Hamilton seems to think that there is little hope of gaining anything in length in cases of shortening caused by overriding, because the muscles have become permanently contracted by adjusting themselves to the new condition of things;[2] while George W. Norris doubts whether reunion would occur, owing to the rounded and smooth condition of the ends of the bones in such cases.[3] This is, it seems to me, not a valid objection, because it is not probable that the bones could be placed end to end after refracture, and thus would therefore lie alongside of each other with portions in apposition which had previously been united by the now ruptured callus. The shortening would be diminished, but not so entirely overcome as to allow end-to-end apposition. Hence union would occur as in other cases.

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[1] See Dr Lente's suggestion under the modes of refracturing mentioned below.

[2] W. C. Cox, *American Jour. Med. Science*, April 1875, and Jarvis Wright, *Archives Clinical Surgery*, Feb. 1877.

It must not be thought, however, that shortening preventing locomotion is the only indication pointing to refracture. In the upper extremity, especially, shortening is of little moment compared with freedom of motion in regard to flexion and rotation. Hence we see that the propriety of operation depends not only on the amount of deformity, but also upon its character. A distortion of the leg involving osseous deposition between tibia and fibula would be a small inconvenience, while the same condition in the forearm would be a lamentable result of a badly managed fracture of the radius or ulna. Hence deformity, which has allowed approximation of the bones of the forearm, and has given rise to restriction in rotation as a sequence, may very properly be looked upon as a fair indication for operation. Replacing the bones in perfect relation with each other, and the subsequent absorption of unnecessary callus, may restore the functions of the parts to their normal standard, provided the time of operation be not too remote from the original injury. So also in fracture about the joints where the deformed condition of the limb militates against flexion and extension, or the callus causes loss of muscular power, benefits may be derived from rupture of the callus and readjustment of the ends of the broken bones. Skey has operated also in cases where there has been persistent pain from pressure of nerve trunks in the callus, or entanglement of muscular or fibrous tissue in the same

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[1] *Medico-Chirurgical Trans.*, xlii. p. 26 (1859).

[2] *On Fractures and Dislocations*, 4th edition, p. 475.

[3] *Contributions to Practical Surgery*, p. 120 (Philada.)

substance. Again, if the distortion be great, it may at times be justifiable to operate for cosmetic reasons, just as benign tumours of unsightly appearances are daily subjected to operative treatment. The general rule to govern the selection of cases may be formulated somewhat in this wise,—when the deformity is attributable to causes incidental to the first fracture, but avoidable in the second, and is of sufficient degree to interfere with perfect motion, and to cause persistent pain or great unsightliness, refracture is to be employed as a means of relief. Unfortunately cases presenting themselves for relief are usually those that have not been under observation during the treatment of the fracture. It is therefore difficult to appreciate the causes of the deformity, whether it be due to great obliquity and smoothness of the fractured surfaces, to great muscular irritability, to the unwillingness of the patient to submit to restraint, or to the ignorance of the original attendant. Consequently it is at times a question whether the displacing causes can be avoided in the after-treatment,[1] and the surgeon has to operate without knowing exactly what agents are to give him most trouble. The mere matter of great muscular development certainly should not deter us as much as formerly, for with the improved method of extension and counter-extension[2] it is possible to tire out any muscular masses that tend to produce displacement, and in certain instances tenotomy may be called upon as an adjuvant to extension.

The locality of the fracture has some bearing on the propriety of the operation and the exact manner of performing it. A slight amount of shortening, or even a decided crook in the humerus or clavicle, is of little detriment to a man, while the distortion occurring in a female, or in the lower extremity of either sex, would perhaps be sufficient cause for undertaking an operation. Again, a degree of displacement of little moment in the shaft of a bone may be a serious impediment to the free use of a ginglymoid articulation, or may interfere greatly with the tendons as they lie upon the expanded extremity of the bone. This matter of location is also of importance respecting the feasibility of refracture, for it is easily seen that it is exceedingly difficult to apply the rupturing power when the deformity is close to the hip or shoulder joint, for the upper fragment is not readily steadied during the manipulative processes.

Another desideratum is the determination of the time after the original fracture that it is possible to tear asunder the united fragments. This necessarily must be variable, as solidification in fractures depends on sex, age, character, and situation of lesions, and a host of other contingencies. Dupuytren, in a series of some fifteen cases, says[3] the period of resetting varied from twenty days to six months, and that, as a rule, the reunion was more rapid in the instances where readjustment was done early. It is well known that the greater the displacement the larger the amount of callus deposited, hence it is more than probable that, in instances requiring readjustment, the callus is longer than usual in becoming perfectly firm and bony. Skey believes that after four or five months the bone is often still fibro-osseous.[1] Nelaton believes[2] that it may be attempted as late as a year after the injury in adults, and even later than this in the case of children. Velpeau goes further, and says that angular deformity may be broken at any period if there be much interference with the function of the limb. Mr Gay, at the Royal Free Hospital, London, refractured the femur for angular deformity about twelve months after the original injury.[3] In truth it may be said that absolute time has nothing to do with the matter, but that the surgeon must be guided by the practicability of refracturing the callus uniting the displaced ends, and this cannot be determined until trial has been made on each individual case. The only limit would seem to be the injury of the soft parts that might result from applying great power. This is fortunately giving us a wide range, since it is astonishing how much the surrounding tissues will tolerate without resenting the rude handling Looking at the cases reported from the Pennsylvania Hospital, we find that severe inflammatory reaction occurred in none of them If we recollect that high inflammation subsequent to ordinary fractures, that are not compound, is comparatively rare, and that when found as a sequel, it is in great part due to the sharp spiculated fragments forced into the soft parts at the time of acciden or during transportation, we can understand its conspicuous absenc after refracture, where the ends are more or less smooth and rounde and the bones are placed at once in proper retaining apparatus An interesting case is reported[4] by Dr Walter of Pittsburg, whe he made, without success, protracted and vigorous efforts to refracture a femur at the end of about three months, and yet the patien got up the next day and complained only of soreness. At a late period he operated by cutting down upon the deformity.

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[1] See Case VIII., recorded below.

[2] See Case VII.

[3] "Diseases and Injuries of Bones," *Sydenham Trans.*, p. 70.

Skey operated on a fracture of both bones of the leg in a boy where the union did not seem perfectly firm, at a period of thirtee months after the injury, and obtained a good result, reducing th shortening from 2 inches to ¾ of an inch, and enabling his patien to walk with scarcely a limp. The time, then, at which it become useless to attempt refracture cannot be fixed, but let the operatio be tried in appropriate cases at any time, and let the surgeon b governed in regard to amount of power only by the dangers to th soft parts, for, as far as the bone itself is concerned, it will break if he can break it at all, at the seat of the former lesion. Th question, however, will be discussed under the various objection that have been urged against the procedure as a treatment for deformity after fracture.

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[1] *Medico-Chirurgical Transactions*, vol. xlii.

[2] *Lectures on Clinical Surgery* (Atlee), p. 184. [3] *Lancet*, 1850, vol. ii. p. 45

[4] *Med. and Surg. Reporter*, Phila. 13th Jan. 1866, p. 28.

It may be asked whether an operation would be justifiable in deformity resulting from fractures that have been carefully watched and treated on the most approved principles from the beginning. The majority of cases that offer for treatment by refracture are, of course, maltreated or untreated fractures, which have not been seen before by the surgeon who is to operate. Should the same surgeon be willing to undertake refracture in a patient whom he had treated in the best manner from the time of original injury? I think this question should be decided affirmatively, if he thinks the experience gained in regard to the individual characteristics of this particular fracture render it probable that he can overcome the displacing elements by some alteration in the manner of treatment, or by some additional co-operation on the part of the patient.

Means of accomplishing Refracture.—Having discussed the subject of selections of cases, I must turn now to consider the various procedures and appliances employed in effecting the desired rupture of the bond of union. The most simple method, when it is possible, is to bend the distorted limb into position with the hands, as is done when it is desired to straighten partial fractures occurring in childhood. This is only practicable when the union is of recent date or the bone small.

I had written that any preparatory softening of the callus by poultices and fomentations was impracticable, when the following case reported by B. W. Switzer[1] met my eye. A Hindoo boy, aged 4 years, after sustaining a comminuted fracture of the right humerus, had received no treatment. Dr S. saw him eight months subsequently, and found a large mass of callus without any motion or crepitus, and ordered inunctions twice daily, with 100 grains of iodide of potassium and 10 grains of iodine to the ounce of lard. Internally, the patient was given one grain of iodide of potassium twice daily. About three weeks subsequently crepitus was detected, and the mass of callus was found to be breaking up, which process continued until all the callus was absorbed and the fragments were movable. The medication was then stopped, splints were used, and reunion occurred in good position. This seems to give weight to the opinion of Dupuytren, who believes that certain applications had a softening action upon callus. In regard to the application of the force, Skey says, "It must be persistent, because the rupture is a species of slow laceration or tearing, and occurs gradually. To this I must take exception. Although the callus in its early stages is fibrous and capable of being moulded into shape by slow laceration (see Axel A., Case V.), yet, in the majority of cases presented to the surgeon, the bond of union is firm, and, when ruptured, gives evidence of its solidity by a sharp snapping sound. When this is once heard, the problem is solved, and restitution can usually be effected. Hence it is that by a sudden force the uniting bond can be ruptured easier than by a gradual strain brought to bear upon it, just as a boy breaks by a sudden bend a stout stick that he could not tear apart by continuous pressure. When the fracture is too firmly consolidated to allow replacement by mere bending and rotation with the hands, it becomes necessary to use some method that gives a better opportunity of utilizing the strength of the operator. Thus, he can make a fulcrum by bringing the limb across the end of a table, or by placing a hard block or pad under the convexity of the angular displacement. Again, he can bind a straight splint along the limb from the seat of fracture to or beyond the distal extremity, and thus control the joints and gain leverage; and, at the same time, by placing a similar support upon the limb above the point to be fractured, can render the occurrence of fracture at a new situation impossible. This, however, is probably never necessary. Another device of a mechanical kind is a screw-press or clamp by which great pressure can be exerted to break down the arch formed by the bones. Bosch of Augsburg, Purmann, and Œsterlen employed a machine of this description, and, recently, Mr Butcher adopted this method very successfully in a case of fractured femur of five months' duration where there was nearly five inches shortening and great angular deformity.[1] These methods are especially adapted to cases where the fragments have united at an angle. When the deformity depends upon lateral application of the two bony cylinders, rupture must be attempted by flexion across the bond of union, combined with rotation in the axis of the limb and strong extension and counter-extension. As has been stated, these cases are less appropriate for treatment by refracture than the former variety. Indeed, in some cases of this kind, as well as in others where the shortening is great, it may be well to keep the patient etherized and continue the excessive extension for an hour or so after rupture, in order to gain as much length as possible before dressing the fracture. One of the cases here reported when the time after the injury was six months, and where callus existed in large quantity, the two methods were con-

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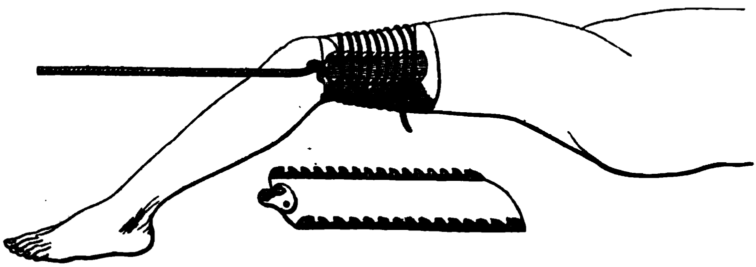
[1] *Medical Times and Gazette*, 19th September 1868, p. 352.



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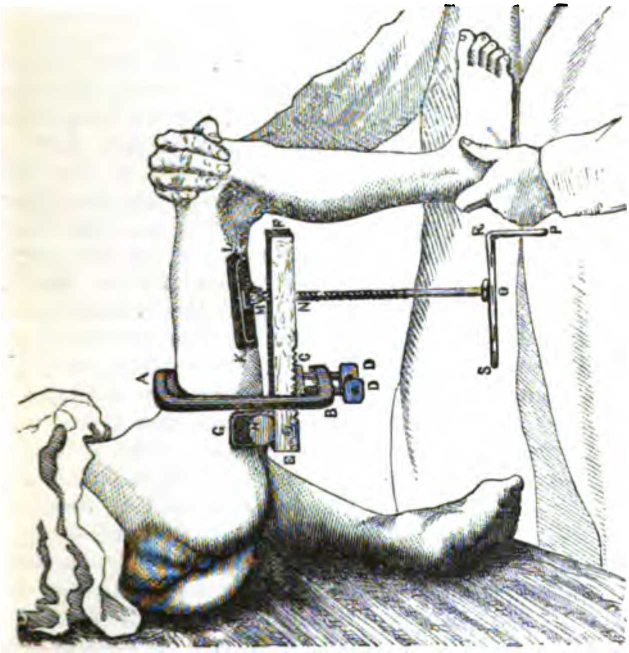
[1] *Dublin Journal of Medical Science*, vol. lviii. 1874.

joined; and while powerful extension by pulleys was made, strong sudden force was applied to the convexity of the deformed thigh (see Case VII.)

In order to obtain a firm hold upon the limb when making extension by the compound pulleys, and yet to distribute the pressure so as not to bruise the tissues, Dr Luis has recently devised a hook to be applied to the leg to give attachment to the pulley rope. It consists of a strong iron hook, the upper part of which expands into a flat plate about 7 inches long and 2 wide. This plate is slightly curved transversely to apply itself to the limb, and is roughened. On the upper surface of this plate, at each side, there extends a longitudinal ridge serrated by deep notches cut into it. The appliance is adjusted in the following manner:—After a bandage has been applied to the limb at the point selected, the plate and hook are laid upon it, then a strong cord is carried around the limb circularly and over the plate, catching in the saw-like teeth on the ridges above. This binds the hook and plate firmly to the limb just as sailors splice two spars together by a rope. Finally, the compound pulleys are applied and extension made as required without danger of the skin and muscles being lacerated by the rope, since the pressure is distributed over a large surface.



The osteoclast devised by Dr C. F. Taylor of New York, for producing a transverse fracture at any selected point with ease certainty, and safety from after-complications would, I shoul think, be applicable to refracturing the callus in deformed union though the instrument was invented for fracturing the femur i cases of anchylosis of the hip in which fracture was desired i preference to osteotomy. A description of the appliance will b found in the *New York Medical Record*, vol. xii. 1877, p. 241. Th osteoclast of Rizzoli would also, no doubt, be applicable in certai instances.

I shall append the notes of some cases occurring in the Pennsylvania Hospital to show the character of the deformity, the method of operating, and the results obtained by refracture after deformit following fracture.

CASE I.—*Fracture of the Tibia and Fibula near the Ankle. N Treatment. Refractured at the end of Five Weeks, followed b Cure without Deformity.*

B. T., a girl aged 13 years, was admitted to the Pennsylvani Hospital 30th December 1875, giving the following history:—Fiv weeks previously, her left foot had turned while walking; subsequently she had considerable trouble with it, but had seen no physician. She came to the hospital because of the deformity which did not prevent her, however, from walking, though she wa lame. The foot was displaced outwards to a marked extent, and perhaps somewhat backwards, as occurs when the line of fractur extends through the fibula and outer portion of tibia, but running into the ankle-joint without chipping of the internal malleolus. Dr R. J. Levis determined to refracture, and endeavour to place the fragments in proper position. Under ether, strong manipulation caused the callus uniting the bones to give way, and the leg was then dressed with an internal straight splint, and a pad used as a fulcrum after the manner of Dupuytren's apparatus for fractured fibula. This overcame the tendency to displacement outward. Eleven days later this splint was removed, and as there was not much displacement the leg was put in a fracture box. When eight days more had elapsed, a firm dressing of glue and oxide of zinc was applied, and the patient allowed to get up on crutches. She was discharged, after having been in the wards for one month and four days, with scarcely any appearance of displacement, and able to walk well without crutches. During the treatment there were no severe symptoms of acute inflammation developed, notwithstanding the force required to rupture the callus bond joining the bones.

CASE II.—*Deformity from Maltreated Fracture of the Tibia and Fibula Cured by Refracture.*

Joseph G., aged 37, was admitted to the Pennsylvania Hospital on 21st November 1877, with marked deformity of the left leg at the lower third, resulting from a fracture received about three and a half months previously. There was great distortion just above the external malleolus, and the foot was so strongly inverted that the patient walked upon the outer edge and was obliged to use a cane. On the 24th, Dr Morton, by strong manipulation, succeeded in refracturing and bringing the limb into fair position. Two days later, similar efforts were again applied to force the bones into better position, and by this means the leg was rendered straight. These operations were done under anæsthesia. No decided inflammatory symptoms followed, there was no pain, and on 3d January 1878 the pasteboard splints, which were used after the fracture-box was discarded, were removed, and the union found to be firm. The patient was allowed to bear some weight on the injured limb, though he still used crutches. One week later, it was noted by Dr Hand, the resident-surgeon, that the patient was walking about the ward; there was little or no deformity, and the union was good. He was discharged from the hospital on 18th January 1878, with firm union and with no appreciable deformity.

CASE III.—*Fracture of the Humeri and of the Right Tibia and Fibula badly treated and resulting in Deformity. Refracture of the Leg producing a good Cure.*

John A., sailor, aged 26 years, had fallen from aloft exactly six weeks previous to being admitted to Dr T. G. Morton's ward, and had sustained fracture of both arms and of the right leg. He had received little or no surgical treatment on shipboard, and consequently the fractures united in bad positions. In the right arm, the fragments overlapped from 1 to 1½ inches, and were firmly united with considerable outward bowing; the left humerus was also consolidated, but presented only ½ to ¾ of an inch overlapping, and very slight curving from the straight line. The right leg was broken at the junction of the upper and middle third, but was not firmly united; the bones bowed backwards and inwards sufficiently to render it desirable to make some attempt at straightening the limb before complete consolidation occurred. This was done the more readily because the fractures of the upper extremities had delayed the deposition of callus around the seat of injury. After forcibly placing the fragments in good position, the surgeon placed the leg in a fracture-box. Fifteen days later a silicate of soda dressing was applied, and soon the patient was moving about on crutches. At the end of six and a half weeks the union was firm and the position of the fragments good.

Case IV.—*Refracture of firmly-united Fractures of the Humerus and Femur in the same Patient followed by great Improvement.*

S. S., 15 years of age, an Italian sailor, fell from aloft and sustained a fracture of the left humerus near the middle, and also broke his right femur at the middle third. When he was admitted to Dr Hewson's ward, some time after the accident, there was much deformity of the arm, and 1¼ inches shortening of the right leg. Both bones were quite firmly united in these faulty positions, hence it was decided to rupture the provisional callus and attempt better approximation. This was done, and dressings applied to maintain the fragments in such a position as to prevent the occurrence of overlapping. Twelve days after the operation, an immovable plaster of Paris dressing was applied to the leg from the waist to the ankle without etherizing the patient. The arm had previously been dressed with a lateral splint and pasteboard. In about three weeks the plaster dressing was removed, revealing a shortening of fully one inch; whence it was decided to apply extension by weights and adhesive plaster. After the lapse of six and a half weeks from the time of operation, there was perfect union of the humerus with some overlapping; and there appeared to be firm union of the femur with about one half-inch shortening. A few days later the boy walked on crutches, and passive motion was begun to overcome the resulting stiffness of the knee-joint after his confinement in bed with the limb rigidly extended.

Case V.—*Vicious Union after Untreated Fracture of the Femur above the Condyles. Refracture followed by a Perfect Cure without Deformity.*

Axel A., a sailor, aged 17 years, was injured at sea by the hatch being thrown violently against his right leg during a storm. The accident occurred, according to the captain's account, about three weeks before the patient's admission to the hospital; but the patient himself states that six weeks had elapsed since the injury. The latter statement is probably correct, because the fracture was too firmly united for so short a time as three weeks. When admitted, the boy could walk, though with difficulty, and there was found one and a half inches shortening of the right leg, the whole amount of which was confined to the femur. The circumference of the injured thigh above the patella was 2¼ inches greater than that of the other limb in the same position. The tibia was thrown backwards, and the patella dragged into a slanting position by the posterior displacement of the lower fragment of the femur, which of course consisted of both the condyles. The boy, who was a patient of Dr William Hunt, was etherized, and a stout split firmly bandaged to the leg to prevent fracture, except at the old seat of injury, and to give leverage; then the callus adhesion was broken by force, which, by the way, yielded slowly, as if the solidification was not complete. By the application of extensive apparatus, the limb was brought down to the same length as the other. He was kept in bed a little over seven weeks, and at the end of about two months was allowed to walk with crutches. One month later he was discharged with no deformity and with no shortening, and was able to walk without a limp.

(To be continued.)

ARTICLE II.—*Case of Peritonitis from Bursting of an Abscess; with Post-mortem Examination of the Body.* By ROBERT SMITH, F.R.C.S. Ed.

CALLED suddenly, and for the first time, to see the patient, a weak girl of 19 years, I found her exhausted and in great pain. She lay on her right side in a crouching posture, her legs drawn closely up to the chest. The slightest movement aggravated the pain. On turning to the back, she still kept the limbs drawn up, not only to avoid the weight of the bed-clothes, but also instinctively to relax the abdominal muscles. The countenance wore a look of apprehension; the lips were bloodless, the features thin and shrunken, but the eyes were prominent and bright—almost glistening. The whole face wore such a woe-begone expression of patient suffering as has seldom been my lot to witness. It was evident she had suffered for a long while. She complained of headache, but her intellect was clear, and she answered questions distinctly, though in a feeble voice.

From her relatives I gathered that she had been subject to "fits of pain" for more than two years—at an early stage, most probably of a very indefinite character; that she had had diarrhœas alternating with constipations more or less during the whole of that time; that she had occasionally vomited her food shortly after eating; and that the digestion of food during that period had been accompanied at times by pain in the region of the stomach of a more or less violent character. This pain generally lasted for two or three hours, but sometimes vomiting set in, after which the pain was relieved. Latterly this pain had become more constant on eating, so that she had come to eat very sparingly from a dread of bringing it on. Liquids gave her least pain. On the present occasion she had become suddenly worse during the early morning, while asleep, from which the violence of the paroxysm had awakened her.

On proceeding to examine her, the first thing apparent was the emaciated condition of the body. There was no œdema. But, though the body was so worn, the entire abdomen was swollen and hot, and as she lay on her back, bulged a little at the sides. On percussion, it was tympanitic above, dull at the sides, until about half-way up, when the sounds became resonant; and on gentle palpation it became evident that it contained fluid. Pain, increased on pressure, existed over the entire abdominal surface, but it became intensified on approaching the region of the stomach, a little to the right of the mesial line, thus localizing the mischief. There, over the stomach, in close proximity to the liver, the slightest touch increased the suffering, so that further examination could not be borne; and being satisfied as to the cause of the illness, the patient was no more disturbed. The pulse was small, very irregular, and thready. It was not possible to count its beats. The skin was moist and warm, the tongue was parched, and she expressed herself much comforted by the occasional application of a little moisture now and then to the lips.

In this case the diagnosis was very certain. The prognosis was equally so, and unfavourable. It was so communicated to the relatives. She died in seventeen hours; and on application next day, I gave the certificate in the usual form, peritonitis being the immediate cause of death.

Owing to a cruel report which had been spread abroad, affecting both the dead girl and her step-mother, a post-mortem examination of the body was directed. Eight days after death this examination was made. Of this, the following are the notes in as far as they bear on the cause of death:—

Of external appearances, it is only necessary to say that the body was much wasted, and that there was no mark of violence. The abdomen was distended with gas. On cutting through the abdominal wall, the intestines were seen floating on a dark brownish liquid, with which the cavity was more than half filled. Portions of the intestines were inflamed externally, and old adhesions existed here and there. The mesenteric glands were hard and enlarged. The peritoneum was dark in colour, somewhat like the liquid mentioned above, with shreds of curdy matter on it and the subjacent intestines. It was very friable. The under surface of the stomach was little altered, but its upper surface was thickened throughout its whole extent, and was firmly adherent to the under surface of the liver and gall-bladder, presenting towards the abdominal wall a thickened, cancerous-looking mass. In this mass, just free of the portion adherent to the liver, was an abscess empty now, large enough to admit the thumb, around the ragged edges of which, as well as on the neighbouring parts, lay a thick matter consisting of broken-down pus and blood. The remains o a thin membrane which had covered this in life, were lying sunk inwards towards its cavity, but these broke down on introducing the finger to ascertain the size and connexions of the cavity itself Two sinuses penetrated inwards through the thickened mass obliquely in the direction of the cavity of the stomach. It was th bursting of this abscess, which, producing peritonitis, had been the immediate cause of the girl's death.

Of the other organs, the heart was small, the right side partly filled with dark blood, the left side empty. There was a little fat on it. The pericardium contained a little serous fluid. The lungs were not specially diseased, though, in common with the other organs, they had suffered from the patient's delicate state of health. The liver was pale; otherwise it presented nothing calling for notice.

In the absence of ascertained data, it is impossible to follow step by step the phenomena of this interesting case, or to assert positively which was the starting point of her complaint. It seems probable that she had suffered from partial peritonitis at different times, and we can well conceive that, at an early stage, the case must have been one presenting considerable difficulty. When the adhesions between the liver and stomach began, or from what the mass on the upper surface of the stomach took its origin, cannot be affirmed. The opinion I have formed is, that the inflammation, or series of inflammations, which resulted in the adhesions between the liver and the stomach, aided by privation and a bad constitution, is the starting point to which we must refer the cause of all that afterwards followed. After the adhesions were formed, moreover, the thickening (inflammatory?) process of the superior wall of the stomach continued. A portion of this softened, broke down, sought a means of escape, and bursting, set up that severe inflammation which in twenty-three hours after its commencement (seventeen hours after she was seen), put a period to the patient's life. The wasting of the body is sufficiently accounted for, if we bear in mind the symptoms that for two years had been a source of discomfort to the poor girl. Frequent diarrhœas, occasional vomiting, constant difficulty in, and pain during digestion, would cut off the nourishment required to sustain the vital force; added to which, the acquired habit of eating very sparingly from dread of inducing one, or all, of these disorders, and we have a series of factors, any one of which, if continued for a sufficiently long period, would of itself induce the condition in which the patient was found. But when we have all of them combined, it is not difficult to understand that such a state must result. The general wasting of the body was inevitable.

ARTICLE III.—*Illustrations of a Novel and Successful Treatment of Psoriasis.* By JAMES ADAMS, M.D., etc.

(*Read before the Glasgow Medico-Chirurgical Society, May* 1878.)

I RECOLLECT that the late Professor Syme, when treating of diseases of the ear referred them to two classes, viz., those which were *curable*, "treated by the surgeon;" and those which were *incurable*, "treated by the aurist." A somewhat similar distinction might be made between skin diseases. For there can be few medical men of experience who have not, in vexatious despair, handed over to the skin specialist cases upon which they have for weeks, months, and it may be years, lavished their stock of the conventional remedies of authoritative dermatologists. And in the converse there can be but few medical men of experience who have not had returned upon their hands cases upon which the skin doctor had directed with ostentatious variation his battery of similar specific and similar insufficient remedies. There is, in truth, little question that numerous diseases of the skin are very unmanageable.

It is a common explanation and a common belief that those diseases of the skin which afflict with the most unconquerable tenacity owe their stubborn qualities to some mysteriously morbid condition of the blood--some constitutional bias—which can only be expurgated or rectified by internal remedies, *i.e.*, the *hæmato-cathartics*, which, acting upon the skin, bowels, and kidneys, eliminate the morbid leaven through these channels. And orthodox courses of arsenic, mercury, antimony, iron, etc., alternately with drastic purgatives, are almost necessary elements in the treatment, supplemented though they may be by filthy baths, restrictions in diet, changes of climate, etc. Of the usually inveterate diseases, among the most obstinate, most loathsome of aspect, and most destructive of the general comfort of the sufferer, is psoriasis, or the common English leprosy. And until the present time I have always accepted the conduct of these cases with great reluctance, and got quit of them, I fear, with little of satisfaction to myself or to my patient. Even where improvement occasionally follows upon the use of any of our stock medicaments, that improvement can rarely be predicated with confidence; nor reliance felt that the same remedy will arrest or "stamp out" the disease in its inceptive stage, on the occasion of its return. With a return of the disease, a return to a round of the old empirical routine is almost a necessity.

Of the common notions held by even the best informed regarding psoriasis, I will relate an illustration which indeed has evoked the present communication. About eighteen years ago I consulted with the late Dr Macfarlane, Professor of Medicine in Glasgow University, upon the case of Mr G., a gentleman aged 24, who for nine years previously had suffered under a bad form of psoriasis. *It* was not a *pro-formâ* consultation, for I had exhausted my resources and really wanted help. But Dr Macfarlane, after learning the course of the ailment and of its treatment, frankly stated that he could only sympathize with me in my difficulty, nor would he make any other suggestion than that of beginning *de novo* a round of the old remedies in the hope that one or other of them might occasionally mitigate the severity of the affection. "But depend upon it," said he, "that man's blood has got a taint, his constitution has got a kind of twist, and his disease will never leave him, do what you may."

During the eighteen years that have passed since my consultation with Dr Macfarlane, this case of Mr G. has been continuously under my observation, and my efforts for its cure or relief have been stimulated by the circumstance that my patient is also a much-valued friend. In addition to my own promptings, the suggestion of several eminent specialists have been carried out. There has been careful regulation of diet, habitual exercise in open air—whether in walking, riding, or yachting—changes of climate at home and abroad, etc., together with potent constitutional remedies and local applications, all exhaustively employed. As is common in such cases there have been from time to time occasional gleams of improvement, but never of perfect relief, and his condition on the whole has been so distressing that he shunned society and oftimes "felt weary of his life." In September last the disease was at the worst that I can recollect, and from his head to his feet the eruption was so copious that there existed only here and there some straggling patches of sound skin. Meanwhile, setting aside the mental disquiet and bodily discomfort, he remained of robust habit, and his general health as regards function was good. Such was the state of matters at the end of twenty-seven years of customary orthodox treatment.

About this time, from various indications, I judged that, in advance of most modern authorities, Dr Balmanno Squire of London had given evidence of being a man of progress, and of original conception in his own line of a skin specialist. I therefore, although with much misgiving of any profitable result, recommended my patient to place himself under the care of that gentleman, provided that, after full knowledge of the history of the case, he had reasonable hope of giving relief through some mode of treatment differing from what had so long and so fruitlessly been employed.

Dr Squire, after seeing my patient and hearing all necessary details, expressed his conviction that, unless in a remedy which had recently come within his knowledge, the remarkable properties of which in this disease he had discovered, and in great measure already verified, he would really have had nothing reliable with which to cap the previous treatment. But with considerable consideration for the valuable time and other interests of my patient, he resolved to employ double weapons, and to conjoin the use of an internal or constitutional remedy, viz., phosphorus in large doses. But he relied mainly on the new remedy, chrysophanic acid applied locally in the form of an ointment. He began treatment on 24th September 1877 with an industrious energy that my patient felt to be "tremendous," and by 1st October the greater part of the eruption had disappeared. On 26th October my patient left London for Glasgow in a condition of complete freedom from his long-experienced affliction. I saw him on the day after his return, and had him stripped and overhauled, my expressions of surprise and admiration evidently giving intense delight. No transformation from extremest disease to the most perfect health could be more marvellous—no illustration of medical skill more creditable, and no instance of relief from suffering through the use of medicaments more complete. The cure was a perfect work of art, and my congratulations to my patient and acknowledgments to Dr Squire were sincere and heartily expressed. The cure continues complete at the present date—an interval of six months.

I was naturally much moved by this case, as much through the personal interest I had in the sufferer as by admiration of the brilliant efficiency of the new remedy, and its important promise in skin therapeutics. I accordingly gathered from my patient—a gentleman of quick intelligence—all the circumstantial details of the manipulations, and generally of the treatment, some of the incidents of which were very amusing, and all of which I keenly appreciated, as giving me a substantial basis of special knowledge for my guidance in the farther trials that I at once determined to make. For however conclusive the result in this case, it remained to be proved how far that result had been individual, or how far it might be corroborated in an extended experience; and I fortunately chanced to have some peculiarly favourable opportunities, the illustrations of which I will now submit to your judgment. As the antiquity of an old Scottish family was often linked with the inheritance of what Peter Peebles called "a good-ganging law-plea," so will length of years in medical practice be often found linked with the unwilling burden and responsibilities of a case of good-going skin disease.

Miss E., aged 24, in the customary possession of excellent general health, had suffered, with only occasional and partial relief, from an aggravated form of psoriasis. The principle and the details of treatment pursued in her case throughout this long period had been carefully considered and intelligently carried out. Two of the foremost dermatologists, of whom my friend the late Professor Bennett was one, had been consulted on various occasions, and their suggestions were supplemented by my best efforts. Arsenic, as usual, was administered, even for years continuously. Mercury was given in lengthy alterative courses, and so likewise was iron and other blood tonics. Tar and its analogues, *ol de cade, ol Rusci, liquor carb. detergens*, medicated baths, vapour baths, sea baths, indiarubber underclothing, cotton pledgets saturated with plain water, or medicated dressings covered with oiled silk, etc., *usque ad nauseam*, were persistently and exhaustively employed. The external application of ointment of pine tar for six weeks at a time, on which Dr Bennett placed the strongest reliance, was the only remedy which decidedly influenced the disease; but neither it—although cheerfully submitted to, notwithstanding its repulsiveness—nor any other remedy seemed to prevent the speedy return of the disease, and when it did return no remedy prevented the steady advance of each relapse. Under ordinary conditions, the eruption was so extensive as to leave only occasional islands of healthy skin, and the distress which it occasioned was greatly aggravated by its occupying the scalp, and so necessitating the use of a wig, and by its disfigurement when it extended to the forehead, face, and neck, for which no mask could be devised. When I began treatment on 8th November 1877, the condition of my patient was as bad as at any former period. I followed and rigorously carried out all the details of Dr Squire's treatment, local as well as constitutional. Within four weeks the entire eruption was removed, with the exception of some troublesome little spots which lingered for a few weeks longer. But on 31st December the skin all over was perfectly normal, and at the present date the cure continues complete.

The third case, that of Master C., a boy, aged 14 years, presents some special points of interest. With occasional ameliorations, only achieved in each instance under prolonged courses of varied treatment, he had suffered continuously for seven and a half years, and during the last four and a half years he was, with little intermission, almost constantly under remedies directed from time to time by a distinguished skin specialist. The lad is naturally good-looking, with a frank, pleasing expression, but the disease, which had latterly been growing more troublesome and inveterate, had so covered his body, had so disfigured him by encroachments on his face, eyebrows, and ears, and in its totality had made him so miserable and unpresentable, that he could not venture to school or show himself on the streets, while in the presence of strangers he assumed a depressed and altogether "hang-dog" aspect, which met an observer in furtive side glances. Arsenic, iron, tar, carbolic acid, bitter tonics, saline laxatives—all had been taken internally for lengthened periods. Alcoholic solutions of potash, soap with pitch, mercurial inunctions, and warm baths were in alternate use, while restrictions in diet—at one time exclusively to meat, at another to vegetables, with changes of air, now to the seaside, and now to inland specified localities, formed part of agencies that are here too numerous to mention. The case seemed altogether so unpromising that it required all the confidence I was now acquiring to support me in volunteering to the friends my services, and in requesting that I should have an innings with the new remedy. I hope I need scarcely say that, although I volunteered in this instance, the lad's family, under ordinary circumstances, are ranked among my *clientelle.* I commenced treatment on 9th November 1877, employing precisely the same agents as in the two preceding cases, and on 10th December he was seemingly quite cured, his skin presenting little abnormal, excepting the discoloration like that produced by walnut-juice, which for a few days remains after the discontinuance of the local applications. On 28th December his skin all over was as fair, as smooth, and apparently as free from spot as a fresh sheet of white paper. No cure could, to all seeming, be more complete ; but a month afterwards I detected a slight relapse, exceedingly disappointing to me at the moment, but now regarded with satisfaction, for having enabled me to assure myself that even in such an obstinate case a relapse can be met, and almost instantly "stamped out," by a return to the original remedy. There is an interesting circumstance connected with this relapse which will elicit comment farther on.

Of the remaining cases which comprise my experience of the new remedy, several present no remarkable features either in point of duration or severity, and may therefore be disposed of in short summaries. The chief circumstance to be noted is the unfailing certainty and rapidity with which in each instance a cure has been effected.

Mrs M., aged 60 years, of excellent general health, has been affected for an indefinite period with large coarse patches of psoriasis on front of leg, extending nearly from knee to instep. For a long time stationary, the disease is now beginning to extend. Treatment commenced on 26th November, and cure completed by 16th January 1878. Continues well at present date.

Mr R., aged 48 years, general health pretty good. Has had small scattered patches of psoriasis on the forearms, chiefly over the elbow, and several small patches on legs. Treatment commenced 18th November 1877, and the eruption gone on 8th December. Continues well at present date.

Mrs M., aged 38 years, of excellent health. Has been troubled for many years with numerous small patches of psoriasis scattered over arms and legs, varying often in number—never large or coarse, and never entirely absent. Treatment commenced 16th November 1877, and on 3d December was reported cured. When I last had information regarding this case, about two months ago, it continued cured.

Mr W., aged 24, of excellent general health. Has for two years had large patches of psoriasis on both elbows and both knees, and also several small spots on both forearms. They have given little trouble, and received no treatment excepting scratching, picking, and scrubbing with soap and water by his own device. He now seeks my aid. Treatment commenced 17th January 1878, and on 28th January the disease was so nearly gone that patient discontinued treatment for several weeks. When I discovered this and remonstrated, the treatment was renewed—this time with energy—and with rapidly efficient results. At present date he is entirely free from the disease.

Miss H., aged 13 years, of delicate frame but good general health. Has a large patch of psoriasis on wrist and front of forearm, which made its appearance four months ago, and is now extending

Treatment began 1st February 1878, and on 12th March the disease had disappeared, and patient has since continued well.

John L., aged 12 years, an active, healthy boy. Has been affected with a thick patch of psoriasis, about 2½ inches long, on front of left thigh, a straggling patch of equal length on front of left leg, and a patch about size of half-a-crown on front of right thigh. The patches on left thigh and leg have been observed for more than three months, and are now extending. The patch on right thigh only showed a few weeks back. Reserving the large patch on left thigh for a special experiment with another remedy of my own devising, and to which I will direct attention in the latter part of my communication, I applied treatment as in the preceding cases to the right thigh and left leg. Commencing the same on 17th April, the disease was entirely removed on 2d May.

Miss M., aged 19, of robust frame and good general health. She has suffered much discomfort for the last seven years from extremely diffused psoriasis affecting the head, face, trunk, and limbs. She has tried in a haphazard way many remedies, and carried out the suggestions, and "got tired" using the prescriptions of several medical men who have been casually consulted. This was a severe and extensive case, and I commenced treatment on 21st April with great energy, anticipating difficulty from the coarseness of some of the patches. But the entire disease has yielded with astonishing rapidity. On 3d May there is considerable tenderness of the skin at some parts, chiefly on front of chest, where the intumescence exceeds anything I have yet seen. The brown discoloration will of course remain for some days, but I consider the case substantially cured; have discontinued all treatment except soap and water, and I expect within eight or ten days to see a complete recovery.

Here we have ten cases of psoriasis affecting individuals, whose ages have ranged from twelve to sixty years, where the disease had endured from three months to twenty-seven years, and where it varied from the mildest to the most aggravated form, all treated and each case expeditiously cured within a few weeks by a *local* application.[1] I say "local," because the constitutional remedy of phosphorus, so freely administered in the first case by Dr Squire, and, in imitation of his treatment, employed by myself in three subsequent

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[1] At the present date, 7th June, all the cases referred to continue well. And to the list there may now be added two cases which have come under treatment since the reading of my paper. A lady, aged above 65 years, has for "a very long time" had a large patch of psoriasis, limited to the left temple, and resisting a variety of treatment. Notwithstanding the age of the patient and the situation of the disease, I used the remedy in the customary full strength, and with no bad effects. The cure has been rapid—unusually so—and seems to be complete. The other case is that of a healthy young woman, aged 26 years, whose arms from the back of hands to the elbows, and legs from front of instep to the knees, have been for four years affected with patches of the size of a pea to that of a shilling. This case has been only a fortnight under treatment; but, from present appearances, there will certainly be a speedy cure.

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separately the various chemical constituents, he ascertained conclusively that all the healing virtues belonged to one of these, viz., chrysophanic acid.

Chrysophanic acid is treated of very shortly in modern works on chemistry, but its first recognition as an article of the materia medica is, so far as I am aware, to be found in a note attached to the latest edition of Squire's *Supplement for the British Pharmacopœia.* Its therapeutic qualities as the active agent in the treatment of skin diseases are certainly noticed for the first time in the *British Medical Journal* of November 1876 by Dr B. Squire. That gentleman has, on several occasions since, strongly expressed his opinion of its remarkable qualities, and in February last he embodied in a pamphlet of 100 pages (Churchill) the more notable facts of the history of the drug, together with his experience of its effects, and his recommendation as to the best mode of its employment. To that monograph I refer for fuller details on some points that I am treating of only in a discursive manner.

Chrysophanic acid exists as a more or less important constituent of several vegetable substances. It has been found in the common dock-lichen, in the cathartin of senna, and in the medullary rays of Indian rhubarb, being known in the latter case under the names *rhœin* or *rheic* acid. But for commercial purposes it has as yet only been obtained from Goa-powder. Dr Attfield, in a very careful investigation, has shown that chrysophanic acid forms upwards of eighty per cent. of the Goa-powder, and he conclusively demonstrated the chemical identity of the Goa, the Bahia, and the araroba powder.

The high price of chrysophanic acid constituted a great hindrance to the employment of the drug, but within the last twelve months the cost has fallen from 10s. to 5s. per oz., and the probability is that, with increasing demand, the cost will be still further reduced.

Dr Squire recommends that chrysophanic acid should be used in the form of ointment, for which the following formula gives such a full strength preparation as I have accustomed myself to employ: ℞ Chrysophanic acid ʒij., lard ℥j. Digest the acid in the lard at the temperature of boiling water for half-an-hour, stirring constantly. When "set," mix with pestle and mortar.

This strength of ointment will be found generally suitable, but it may, of course, be varied, and reduced in strength to suit cases where the skin is extremely sensitive.[1] To prevent disagreeable results from over-action of the remedy, as well as to ensure that it is not employed in a careless or half-hearted manner, I recommend that personal attention of the medical man should be given during the first week of treatment, and that the case should be seen from time to time while the treatment is continued. The details, if carefully supervised in the early stage, will ensure a progress within a few days that otherwise will not be made in several weeks. These details, together with the accidents of treatment and the *modus operandi* of the remedy, will be best understood by portraying a typical case. The patches of psoriasis are first rubbed well with a piece of stout blotting-paper or common rag, moistened with benzole, the object of which is to absolve and remove that natural greasiness of the skin which, like a film, opposes the ready penetration of the skin by the specific. I believe that benzole—a tar product—has also some specific action, and is therefore otherwise a useful adjunct. This preliminary application of benzole facilitates the next application, viz., hot water freely used with soap, the object being that of softening the layers and fragments of epidermic scales. The removal of the scales is a matter of prime importance, and must be effected whether by scraping with a blunt knife, or by scratching and picking with the finger-nails. It is only when the film of epidermic scales are removed that the skin proper can be fairly attacked, and I have not been deterred by the starting of a little blood from pushing to an extreme degree this scraping and scratching operation. The ointment is now rubbed in very perseveringly for several minutes at a time with the tips of the fingers. As the ointment is a dye, and will stain for some days the fingers and nails, I occasionally prevent that disagreeable accident by recommending the use of indiarubber finger-stools such as are frequently employed by photographers. These three stages of local treatment, viz., the wiping with benzole to remove grease, the thorough soaking of thickened patches of skin with hot fomentations, washing with soap, diligent scraping away of epidermic *debris*, and the patient rubbing in of the ointment, may be employed three times a day if the patient can command the necessary time and facilities. There is no question that the more frequent the application the more rapidly does the disease come under the action of the curative agent. But under ordinary circumstances a morning and evening application seem to give a sufficiently satisfactory result.

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[1] In the comments which followed the reading of my paper, it was observed by Dr Service—assistant-surgeon under Dr M'Call Anderson in the skin wards and dispensary of the Western Infirmary—that successful use was being made of the new remedy in these institutions; but they thought that Dr Squire's formula, as adopted by me, was much too strong. They considered 10 grains to the ounce of ointment as sufficient. The average strength now employed by Dr Squire is 80 grains to the ounce; but I have, as yet, found no reason to alter the formula, which I have hitherto found to be invariably and speedily effective, with no necessarily attendant evil consequences.

Within two or three days there comes on a dusky erythematous redness of the skin, partly the effects of the dye and partly the stimulant and irritant effect of the drug. As its action increases there occurs an inflammatory thickening of the skin in some cases and in particular situations, causing œdema. Thus, the face becomes puffy and the eyelids tumid. It also occasionally happens that stiffness from distention of the skin, with smart sensations of burning and tingling, will be felt all over the affected surface, but seldom to that extent to be positively distressing. In two instances I have known several boils of trifling severity to be produced on the dorsal aspect of the body, where the skin is naturally coarse, and prone to take on over-action; and in the case of Mr. G. I learn that he experienced a full crop of boils, and was, he says, for several days and nights "kept in a very lively condition." Where the hair of the scalp is white or light gray, there will occur a phenomenon against which it is well to prepare the patient. In the case of my friend Mr G, whose hair is naturally white, it rapidly assumed "a fine purple" colour, ending in "a bright canary," and in the change passing through shades and gradations that would excite the envy and aspirations of a decorative house-painter. Indeed he found himself so much "the admired of all observers," and so much the source of wit to the London street *gamins*, that he could only venture a "constitutional" walk after nightfall, while his day life for several weeks was passed in a Hansom-cab, as he travelled to and from his numerous appointments with Dr S. I have not, however, observed this unpleasant accompaniment of the treatment to have occurred in other cases where the hair was of the darker shades. But it is satisfactory to know that, however the hair or skin or nails may be stained, in every instance the natural colour is soon restored after discontinuing the treatment—often within a few days. This restoration does not occur, however, in the case of the underclothing, sheets, etc., when soiled by the ointment, and the patient should be warned, that only articles that are of little value, or in which colour is of little moment, should be exposed to contact with the remedy. One farther warning exhausts all that need be mentioned. A properly secured nightcap will prevent the pillow from getting smeared, and a possible transfer of the substance to the eyelids, which would in such a case certainly become swollen. And if the patient is in the practice of rubbing his eyes awake at early morning, he will do well to sleep in gloves.

After a few days' active use of the ointment the diseased patches of skin cease to shed scales—a few days more, and they become smooth and polished, surpassing in these conditions the surrounding healthy integument—and still a few days more, and then a remarkable change occurs. The affected spots become white—almost unnaturally white, in this respect contrasting very markedly with the surrounding healthy skin, which meanwhile retains the dingy nut-brown staining effect of the dye. If there is now no rough marginal line indicating the original outline of the diseased patch, and if no more scales are being shed, or capable of being picked off or scratched away, then the application of the ointment may be discontinued. Two or three applications of the benzole and of soap and water will within a few days leave the skin free from any trace of the disease. It becomes, indeed, impossible to trace the outlines of where the patches of psoriasis were situated, so completely does the skin resume its original integrity of aspect and of function.

And here there would seem to be an interesting question opened for consideration, but to which I will now do little more than make a reference, and that is the *modus operandi* of the remedy. Dr Squire has some shrewd observations on this point. Most irritants of the skin have very different kinds of effects. Thus the vesicle or pustule of croton oil and tartar emetic, the vesication or erythematous irritation of cantharides and mustard, although differing so widely in their special irritation, seem all to act chiefly on the surface only of the skin proper, and do not affect the deeper structures. But the action of chrysophanic acid penetrates deeply, and affects the subcutaneous areolar tissue with less of surface irritation than these or most other rubefacients. The "quality" of the irritation it produces seems to be different, and to be specific. It seems to affect more or less the entire thickness of the skin, in this respect contrasting very materially with the ordinary local remedies for skin diseases, which have for the most part a very superficial action. May not a full consideration of its action in ringworm and other parasitic diseases lead to the conclusion that psoriasis—like pityriasis versicolor, so long and so lately held to be constitutional —should also be classed among parasitic affections of the skin?

And now comes another important question. Is the cure which I have shown to be so speedily and so certainly effected a permanent cure? The time which has elapsed is too short to admit of answering in the affirmative. But it is scarcely reasonable to expect as much, or to suppose that the same conditions which originated the ailment may not again combine. It ought to be sufficiently satisfactory if the remedy is as reliable as I have shown it to be. And if it will arrest and stamp out a relapse, then its importance and value remain as great as can fairly be hoped for. I think that two of my cases will throw some light on this latter point. In one case, that of Master C., there was, as I have already stated, an element of disappointment. On 10th December I thought him completely cured, and discontinued treatment. I did not re-examine him until 1st February, when I was startled by detecting on close inspection a number of suspicious white spots like an efflorescence, consisting of epidermic scales. They were of size varying from a pin-head to a mustard-seed. Being uncertain how far they indicated a reaction from previous irritation resulting from strong applications, or a relapse, I did nothing for a week, when I found that they had increased in size, being in some instances of the diameter of a pea. They resembled dried spatterings of lime, and when scraped the skin was found red underneath. There was very clearly a relapse. I now resolved on an experiment I had for some time contemplated, and applied to the right arm and the same side of trunk a solution of chrysophanic acid in liquor potassæ, painting each spot with a camel-hair pencil. To the other side of trunk and the other arm I applied—for reasons to be afterwards given—a watery paste of alizarin,[1] causing it to be thoroughly well rubbed into the skin. Within a week the specks of incipient psoriasis had entirely disappeared from both sides of body and from both arms *cum passibus æquis.* I have caused this patient to call upon me at weekly intervals since, and I have kept careful watch for the return of suspicious spots. A very few have appeared on the arms—none on the legs—and under the application of alizarin these spots have promptly given way. In this case, therefore, under two remedies—as I think of allied nature—an impending relapse has been promptly stamped out. Whether this result has been a coincidence or a consequence I will not at present say.

In another case, that of Miss E., there have appeared on the arms three small spots, each of the diameter of a pea. To these, as in isolated patches in a few other cases, I have applied chrysophanic acid mixed with collodion in the proportions of 20 grains of the first to a quarter of an ounce of the last. The spots are well rubbed with hot water and soap, then with strong alcohol, and lastly, painted with the collodion varnish, which instantly dries. At an interval of eight or ten hours the crust of varnish, which adheres very firmly, is rubbed briskly, and removed with a rag dipped in strong alcohol, after which a fresh coating of the varnish is applied. The patches so treated have undergone the same characteristic changes which follow the use of the remedy in the form of ointment, and little more than eight or ten days have sufficed for their removal. In this case of Miss E., a relapse, to all seeming, has been also promptly stamped out by recourse to the original remedy, although in a modified form of application.

The object of using in one case a solution of chrysophanic acid in liquor potassæ, and in another of a chrysophanic acid varnish, was to obviate the greatest drawback to an invaluable remedy—the only real obstacle, indeed, that may occasionally prevent it from being pushed to its utmost efficiency. While hopeful of relief from a great evil, there is a ready submission on the part of the sufferer to the disagreeable incidents which I have referred to as liable to occur in the course of treatment. But when the ailment has been substantially removed, and the patient has fairly got back to the comfort of clean linen, he naturally shrinks from returning to a practice which so surely disfigures his underclothing with ugly yellow stains, and frequently destroys them for farther use. He is, therefore, apt to submit to the insidious approach of a few spots in the hope that they will spontaneously subside—a hope no sensible medical man will encourage. It was, therefore, to me a desideratum to contrive such a modification in the manner of applying the remedy as will, on account of its cleanliness and the ease of its application, encourage the patient to resort to it without loss of

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[1] The alizarin for this and other experiments was kindly presented to me by Messrs Arthur and Hinshaw, drysalters, Bothwell Street.

plexities that beset the best-intended efforts of well-informed medical men conscientiously studious of the interests of their patients, and I have shown something of the distress occasioned by the sufferer from this loathsome disease, hitherto an *opprobrium medici.* I may conclude by illustrating how little, until the present moment, the physician could effect, even under circumstances where his own clamant personal interest, or his dearest feelings of sympathy were involved. A few days ago when discussing this subject with my friend Dr Littlejohn, he stated that very lately an eminent London surgeon, recently deceased, opened up a portion of his dress, and showed Dr Littlejohn the patches of psoriasis that, from the neck downward, bestrewed his body, while he added, with sad resignation, that these for twenty years had been "the bane of his existence." And Dr Littlejohn told me further of another recent instance, that of the darling child of one of the chiefest physicians of this country, but now deceased, who, in his own writings, has done much to throw light on the literature of this class of diseases. This gentleman's daughter received no relief from the vast experience and eminent skill of her accomplished father, or from that of the eminent *confrères* who contributed, with sympathizing diligence, their best services. As now instructed, it is my belief that there will never henceforth occur any similar instances of the insufficiency of medical resources in the treatment of psoriasis.

ARTICLE IV.—*Case of Hour-glass Relaxation, or Irregular Contraction of the Uterus.* By T. SANCTUARY, L.R.C.P. & S.

I WAS called on 24th August 1876 to attend Mrs A., of W—— House, Lincolnshire, in confinement. On arrival, I found her to be an extremely nervous and sensitive lady. This was her sixth confinement, and she informed me that in each one previously she had insisted upon having chloroform. She was apparently a healthy person, and her former labours had been quite normal.

Having examined her and found everything natural, both as to presentation (left occipito-anterior) and size of parts, I wished her to forego chloroform, but as she was unwilling to do so, I administered it, as soon as the pains began to be frequent, and when the os was fully dilated. Everything went on in the usual manner, and the second stage was satisfactorily completed; the child, a girl, being rather small, though at full time. I waited for about twenty minutes, when she said she felt the pains returning; the uterus being well contracted, but larger than I expected. At the end of half-an-hour, as there were no signs of the placenta, having made very gentle traction on the cord without result, I examined per vaginam, but could merely trace the cord upwards, not to its placental attachment, but to its abrupt termination in the os uteri, which was firmly contracted round it. I waited twenty minutes more, and then administered chloroform, determining to remove the placenta by detaching it carefully from the uterus, for I suspected the case to be one of irregular uterine contraction. With considerable difficulty I succeeded, by combining external pressure, in introducing one, two, and three fingers along the cord, and finally dilated the os sufficiently to allow the whole hand to be introduced. I could feel the placenta lying in the upper half of the uterus, which was flaccid, while the lower portion was firmly and evenly contracted. I then administered ergot, and, keeping my right hand *in utero,* proceeded to knead the fundus externally, and in a few minutes was rewarded by feeling it contract, and expel the placenta and my hand together. I remained with her for an hour and a half, in case the uterus should again relax, and hæmorrhage occur, but it remained persistently and wholly contracted, and she made a good recovery without a single untoward symptom. The third stage was completed one hour and ten minutes after the birth of the child.

The case seems to me to suggest one or two points of practical interest.

1st, The danger that might have followed forcible traction on the cord, for the placenta could not have been extracted by these means, and the result of such treatment would have been (until the cord had broken) the same as that of traction on the cervix. The amount of traction I actually used was very little, and merely as a preliminary to determine whether the placenta was lying in the vagina, before giving chloroform a second time.

2d, Did the anæsthetic favour the relaxation? This, I think, may be answered in the negative, for it was only given to partial anæsthesia; and why should one part have contracted, and not the other? Then again, permanent and equable contraction took place subsequently under the influence of manipulation and ergot, although she was under the anæsthetic at this time also (I had previously given ergot at the termination of the second stage).

3d, I think it shows the necessity of exercising patience, and allowing the uterus to contract on the hand, instead of being tempted to extract the placenta too rapidly, on account of the severe hæmorrhage that would probably have followed from the relaxed placental area.

4th, I may advert to the extreme difficulty experienced, both in insinuating one finger through the rigidly contracted os, and also more especially to that which follows the attempt to dilate it by lateral separation of the fingers, for the interosseous muscles are soon fatigued, and for a time almost paralysed.

ARTICLE V.—*On the Study and Practice of Aural-Surgery: Being the Introductory Address to a Course of Lectures on Aural-Surgery, and of Practical Instruction in the Diagnosis and Treatment of the Diseases of the Ear, given during the Summer Session of* 1878 *in the Glasgow Royal Infirmary, and in its Medical School.* By JAS. PATTERSON CASSELLS, M.D., M.R.C.S. Lond., Fellow of the Faculty of Physicians and Surgeons, Aural-Surgeon to the Glasgow Royal Infirmary, and Lecturer on Aural-Surgery in the Royal Infirmary School of Medicine, Glasgow.

GENTLEMEN,—Six months ago, the Board of Managers of this old-established and well-known and important hospital, appointed to its staff an aural-surgeon, who is also the lecturer on aural-surgery in this School of Medicine.

As the incumbent of these important offices, it gives me much pleasure to tell you that I return to the place as a teacher, in which, as a student, I received some of my own medical education, and where, also, more than twenty-five years ago, I witnessed the performance of a major surgical operation for the first time, and which was performed by a gentleman, at that time one of the surgical staff of this Infirmary, who happily is still among us fresh and vigorous in thought as of yore, and whose eye still sparkles with the "Promethean fire" of former days—I refer here to our venerable and esteemed friend, *Dr Andrew Buchanan*, *emeritus* Professor of Physiology in our University.

Need I tell you that these circumstances have awakened within me the happy memories of bygone days, when faith and hope, as well as expectation, were young and fair, and perhaps, also, unreasonable. Need I tell you, also, that this place and these benches recall to my mind's eye the faces and the forms of men who were my companions and my competitors here, and who have, in most instances, since then, found "a local habitation and a name" widely separate from each other, and remote from the scenes and the place in which we spent together some of our student days.

But these circumstances that I have just mentioned, together with the fact of our presence here to-day for the purpose of inaugurating a course of lectures and of practical instruction in the theory and practice of aural-surgery, have served another and a more practical purpose than that of merely awakening sentimental and, perhaps, uninteresting personal reminiscences; they suffice to bring prominently before me the fact that the advantages that are offered to the medical student of to-day, in respect to his acquisition of professional knowledge, are much superior to those that were within the reach of the student of medicine a quarter of a century ago.

To those who are familiar with the history of the progress which has been made during the last twenty-five or thirty years in general medical science, and who recall to memory the great and permanent acquisitions that have been gained in these years in our knowledge of the diseases of the human body generally, not only in regard to their surer diagnosis, but in regard also to their better and more successful treatment, it cannot be a matter of surprise for such persons to hear, that the special department of aural-surgery has participated also in the benefits of this very remarkable progress; a brief reference to which may serve to show you what I mean by saying, that the student of to-day has "superior" advantages over his fellow of former years.

Not to go farther back than the time of my own student days, it may occasion some astonishment to most of you to be told, that in this country in those times, there were no facilities offered to the student to acquire a knowledge of the diseases of the ear, and that even the speciality of aural-surgery itself, as a *scientific* pursuit, hardly existed. Then it was, also, that the diseases of the ear were known simply as "deafness," the treatment of which savoured so strongly of quackery as to be shunned by all medical men who had the smallest regard for their own good name or fame.

It was in those days that the "ear-picker" held sway as an instrument to be used both for the prevention and the cure of "deafness;" when irritating fluids of all kinds were freely poured into the external auditory canal; and when this same canal was wont to be washed out on every occurrence of dull hearing by the "free use" of syringefuls of water, which was hot or cold according to the whim of the operator.

This was the time, also, in which the wool from between the ears of a black sheep, because of its supposed curative powers in cases of "deafness," was esteemed by those who were deaf as of great value, and even more precious to them than an Indian pearl; and when, not only among the laity, but also among the profession generally, the opinion was held, and *consistently* acted upon, that an ear-discharge was salutary, and that it was dangerous to "dry" it up.

Nor is there a single statement of this brief narrative exaggerated, as I can readily show you in a few words.

Toynbee, the celebrated aural-surgeon of those days, who was afterwards to become the founder of Aural-pathology, had just made his first public communication in regard to the structure and function of the membrana tympani, when I was a first-year's student. True, Yearsley had, in 1848, published a work on the *Causes and Treatment of the Diseases of the Ear;* but this and similar previous works were without purpose, so far as the conveyance of real practical information was concerned, to students desirous of such knowledge.

Toynbee, to whose labours I have referred, and which, lasting over a period of well-nigh twenty years, were finally recorded in his celebrated work published in 1860, did not begin to lecture, or even to teach the subject of which he was so complete a master, to students till 1855; nor had Mr (afterwards to be Sir) William Wilde given his admirable work to the profession till I was advanced in my studies two or three years.

Then, and even till 1856, the surgeon who, in his endeavour to discover the cause of a patient's "deafness," desired to examine into the state of the deeper-lying parts of the organ, had per force to use an instrument devised by the veteran Kramer, and which hardly enabled the surgeon to see further into the external auditory canal than he could without its aid—an instrument, by the way, that has done not a little to retard the spread of a knowledge of the diseases of the ear among the general practitioners of this and other countries, because of its faulty construction and the manner of using it.

It was in such times, and under the like circumstances, that the condition of the membrana tympani was ascertained by an *inspection* of its surface by means of a probe!

Mais tout cela est changé, thanks to the pathological labours of Toynbee, and to the accurate clinical observations of the late Sir William Wilde; to the reflecting mirror introduced by Von Tröltsch to the notice of the profession in 1856 at the congress of aural-surgeons which was held in Paris in that year, and to the world-wide known and universally-used air-douche of Politzer, discovered by him in 1861, which has added two new words to our vocabulary of professional terms, viz., to *politzerise*—*politzerising*, while—and this is of more importance—it has blessed and benefited mankind generally to an extent hardly, if at all, conceivable, except by those who know thoroughly its therapeutic value in regard to the treatment of ear diseases.

In this reference to the labours of those men who have helped to advance the knowledge of the diseases of the ear, I must not overlook those of the late James Hinton, who dignified and adorned the practice of this speciality by his life and works, which, as Sir William Gull has lately and truly said, "are stepping-stones for others to rise upon."

So much, then, for these personal and other reminiscences which our presence here to-day has called forth.

Although we are met here to-day to inaugurate a course of lectures, and of practical clinical instruction in aural-surgery, and although I appear before many of you myself for the first time as a teacher of this special branch of medical science, it is not, as some of those present well know, the first time on which instruction of a similar kind has been given in this city, nor is it the beginning of my career as a teacher of this special department of surgery.

On the contrary, and as is well known, Dr M'Call Anderson, who has earned for himself a name as a dermatologist, that bids fair to be, if it has not already become, known world-wide, taught with great success in this special department of surgical science for several years prior to 1872, in which year and at his request I took up the thread of his labours as a teacher of this speciality, and which labours I have since then year after year till now carried on with more or less of success in my own clinique, the "Glasgow Dispensary for the Diseases of the Ear," where in the summer session of 1873 I delivered what I am assured was the first course of systematic lectures on aural-surgery ever given in the provinces.

This, and the fact that during the five years of the existence of my public clinique, I have seen and treated by my own hands, and almost unaided in any way, over 3000 different individuals suffering from ear-disease—is a subject upon which I may be pardoned if I dwell, for it is one in which I have a conscious, and I hope a justifiable, pride.

Gentlemen,—What remains for me to say in this address shall have a pointed reference to the subject that we are about to study together, and for this reason that at the outset, and before entering upon the study of any of the special departments of medical science, I think that the student ought to know in a general way something concerning that one which he proposes to learn, viz., what it is he is about to study and how it is to be studied, in order that he may determine for himself how far he is prepared by previous studies to profit by the special teaching that he is about to undergo.

With the object of giving to the student this so desirable and, indeed, necessary knowledge, I now propose to tell him what aural-surgery is and how it is to be studied; then, finally, I shall hope to be able to show him, that this special instruction whereby he acquires a knowledge of the diseases of the ear and of their treatment, is of especial value to him when, as a practitioner, he becomes engaged in the duties of his profession—indeed, to show him that its possession on his part is *essential* ere he can fill the *rôle* of a *general* practitioner of medicine and surgery.

To the inquiry, What is aural-surgery? many seemingly diverse replies could be given and have been given, to the bewilderment of those who have made inquiry.

On that account I prefer to give you my own definition of the subject of our study as follows:—

Aural-Surgery is the name given to that section of the science of Otology, and which concerns itself alone with all that relates to the diseases of the ear.

Its *study*, therefore, embraces a consideration of the causes, pathology, diagnosis, prognosis, prophylaxis, and treatment of these diseases.

But its *practice* also requires to be defined, and were I disposed to deal in epigram, I would quote from the writings of my beloved and, alas! now deceased friend and master, and say that it is "simply surgical common sense."

This definition and favourite expression of the late James Hinton, who was undoubtedly the most talented aural-surgeon of recent times, is a true and a self-explanatory one to those who are familiar with the subject that it defines; but it incompletely defines the practice of aural-surgery to any one who is ignorant alike of the diseases of the ear and of their treatment. Besides, were I to adopt it on this occasion as our definition of the practice of this speciality, it might prove misleading not only to those of you who know nothing of it, but even to those of my professional brethren whose surgical skill and talents are almost, if not quite unlimited, not to speak at all of the amount of their "surgical common sense."

Therefore, I define the practice of aural-surgery to be the application of the principles of general therapeutics to the treatment of the diseases of the ear, guided by a special knowledge of these diseases.

In the end, however, and with more experience, the student himself will come to the conclusion that, after all, the practice of this speciality is pretty clearly defined by the epigrammatic expression that I have just quoted, for it is really nothing more than "surgical common sense," plus special knowledge, to guide its application rightly to a special end.

And now I come to speak of the principle that underlies all the practice of aural-surgery—that principle is—conservation. By-and-by, I shall in my clinical teaching be able to demonstrate the truth of this statement to you; meantime let me say here, that the practice of this speciality is eminently conservative in its aim, and that it does not exist at all as a scientific pursuit when it lacks it; indeed, its claim to be regarded as a special study as well as a special branch of practice rests upon the fact that its true aim is to prevent and to conserve.

In making this claim of conservation on behalf of the practice of aural-surgery, I am prepared to find some opposition made to it, but only from those who have not studied the natural history of the diseases of the ear, for such a study, coupled with a slight knowledge of aural therapeutics, must suffice to convince them that the claim that I here make is justly made.

I do not mean, however, that the practice of aural-surgery is pre-eminently conservative in principle over the practice of general surgery, or that of the special surgical treatment of the other organs of the body—such as the eye, for instance—but I do say that in none of them is the principle of conservation more beautifully illustrated than in the treatment of the diseases of the ear, especially in the early treatment of some of the diseases of the tympanic cavity and of the Eustachian tubes; it is in such circumstances that the real strength of the practice of aural-surgery manifests itself as a conservative proceeding.

This characteristic of the practice of aural surgery first suggested itself to my mind on reading the celebrated work of Saunders, who was, in truth, the father of English aural-surgery. The perusal of that book, therefore, must ever remain as a memorable event to me, for its outcome was the discovery of this principle of conservation in regard to the practice of aural-surgery. Nor need I tell you that the practical realization of its truth was to me as a new revelation. Henceforth, all that was formerly incomprehensible in regard to the diagnosis and prognosis, as well as the treatment of ear-diseases, became clear to the mental vision. Wavering and doubts that had hitherto existed, and sorely puzzled me, passed away under the enlightening influence of the truth of this principle.

And here let me remark that, if I may judge of your mental state now by the standard of my own past experience, I have to say that, until you in your study of the diseases of the ear realize that in their very nature there is an inarticulate demand on their part to be treated on conservative principles, you must ever remain outside of that deeper and more satisfying, because more certain knowledge, of the diseases of the apparatus of hearing.

From what has been said as to the practice of aural-surgery, it may be seen that its study has for its object to acquire a special knowledge of the phenomena of ear-diseases, and a practical familiarity with the special modes in which the principles of general therapeutics are applied to their treatment. Indeed, it is this need of a special knowledge of the facts of aural pathology and therapeutics that has created, but only within these very few years, and in a very few schools of medicine, this special department of aural-surgery as an independent branch of study for the student.

But while its study is in this way separated from that of general surgery, its practice is in no way severed from it; on the contrary, and as I must have shown you, a general surgical experience is the most fitting preparation for the successful surgical treatment of the diseases of the ear.

So much then, in a brief and general way, regarding the practice of aural-surgery, and how it is to be studied.

And it is an interesting study for the student, even if he, for the moment, regards the organ of hearing, not alone from an anatomical stand-point, as a marvellously formed part of our bodies, which exhibits and makes manifest to us the wisdom and power of a great creative mind, but, from a purely physical point of view, as a delicately-constructed pneumatic machine, whose perfect action is conditioned by the almost invisible movements of a tiny piston, as I may style the stapes bone, whose motions to and fro have a range of not more than the $\frac{1}{13}$th part of a millimetre! A machine, moreover, which is prone to disturbances in its air tension, but provided with an accommodation apparatus of the greatest sensitiveness, whose function in ordinary circumstances is that of averting the evil consequences of such air disturbances. Provided also with an admirable arrangement whereby all the sonorous impulses of air that strike upon it are recorded with a never-failing accuracy.

In evidence of this delicacy of construction, it is only necessary to remind you of the fact that the cultivated human ear, which I have here likened to a pneumatic machine, is formed not only to receive but to record all the sound-waves that reach it within a range of eleven octaves, viz., from 32 to 40,000 or more vibrations in a second of time,—perceiving their differences with equal facility whether these tones reach it in succession or simultaneously.

Such, then, is the organ with which, as students of aural-surgery, you have mainly to do, whose diseases you are to observe and to study.

And although, at first sight, judging from the apparently inaccessible position of the whole of the apparatus of hearing, this study and observation of its diseases may seem to be surrounded by almost insuperable barriers, it is not really so in actual practice; on the contrary, the diseases of the ear are not difficult to diagnose, nor are they very difficult to treat or to remove, when experience and dexterity guide the eye and the hand of the surgeon.

Such success, however, as is here spoken of comes not but by the patient study of the diseases of the organ in all their ever-varying phases; but then it is worthy of such a devotion of time and of energy by the student, for not seldom in a case of ear-disease, even in a general practitioner's career, the greatest inconvenience, and even the most momentous issues, may hang upon the success or the failure of his efforts.

If, from some remarks that I have just made as to the recent recognition in our medical schools of the need of a special study by the student of the diseases of the ear, you have inferred that the subject of our study itself is of recent creation, and, so to speak, without a history, let me here undeceive you.

The study in which you are about to engage is one rich in historical associations, and daily becoming richer as it gains in importance in relation to the body politic; of the truth of which statement I could, did time permit, give you abundant evidence. This, however, I may say, that a subject like ours, which has engaged such intellects as those of that glorious trio of anatomists who lived in the sixteenth century—Vesalius, Eustachius, and Fallopius, as well as that of the famous Valsalva, who, in the following century, spent sixteen years of his life in dissecting more than a thousand heads in furtherance of his study of the organ of hearing; a subject also which, in our own country and almost in our own day, has engaged intellects equally as grand as those of the great men of past times, which interested the elder Munro, and gave zest to the labours of Saunders, Toynbee, Wilde, Hinton, and others, is one surely well fitted to employ all the intellect and all the energy that we have at our disposal.

Merely remarking—indeed it is a trite remark—that a special course of study, such as ours, begets in the student, or develops where it already exists, a habit of close and accurate observation, I now proceed to show the practical value of a knowledge of the diseases of the ear, and of their treatment, to the general medical practitioner.

When I state, as the result of my own experience, that nearly all the cases of ear-disease in the acute stage are curable, and that these, for the most part, first occur within the domain of general family practice, while, on the other hand, most of the chronic cases that come under the aural-surgeon's special care, between the periods of youth and middle life, are incurable, or nearly so,—I use the term "incurable" here to mean, that in these cases the impaired or lost function cannot be restored to its original state of perfection,—and that these chronic and mostly incurable cases have had their origin in the earlier and curable periods of infancy and childhood, I have said enough, I think, to prove that a knowledge of these diseases, such as we desiderate for the general practitioner of the future, cannot fail to be to him of the highest practical value.

On these grounds alone it seems to me desirable that in the future all general practitioners of medicine should possess a fair knowledge of the diseases of the ear.

But there are special reasons altogether apart from these more general ones why they ought to be in possession of this knowledge. These special reasons are as follows:—

Primary disease in the ear frequently causes the most serious changes, both mental and physical, in the general organism, and that in the course of many of the general diseases to which the body is liable the ear becomes implicated.

In regard to these conclusions, which, indeed, are based upon the facts of the experience of all aural-surgeons, I have to remind you of the position and construction, as well as of the vital relations of the ear. Surrounded by the most important structures, and only separated from them by osseous walls of varying thickness and degrees of development, it need not be a matter for surprise that serious and even fatal consequences can follow a simple inflammation of the tympanic cavity; indeed, the closeness of the union that exists between the soft tissues lining this cavity and the bones that form its walls, renders it an utter impossibility that the former can become diseased, however slightly, without the latter becoming also involved in the morbid process. Thus it is that every congestion of the lining membrane of this cavity is a periostitis, and every ulceration of its soft tissues is a caries of its osseous walls, that may, and often, indeed, does end, in the most serious and even fatal consequences.

Then, again, think of the very close sympathy that subsists between the ear and other remote organs in the body, even in a state of health, structurally, and that this sympathy is rendered more acute and sensitive when these organs are diseased; think, also, that the perfect health and the perfect function of the ear—and therefore the sense of hearing—depends upon so seemingly a simple matter as that of the mode or habit of breathing, and that it is only necessary to stop breathing through the nostrils to set up changes in the tissues of the apparatus of hearing that may end disastrously, even fatally, to the person who so breathes.

When you ponder over these general facts as to the anatomical relations of the organ, and the usual results of the pathological processes that go on in its tissues, and these other ones relative to its sympathy with, and dependence upon, other and remote organs of the body, you can appreciate much better the worth and the weight of the special reasons that I have adduced in support of my position as to the practical value, and the absolute need, of a knowledge of the diseases of the ear to the future general practitioner of medicine and surgery.

Were I to enumerate the somewhat formidable list of the diseases in which the ear plays, whether actively or passively, no unimportant part, and which I am only hindered from doing by the knowledge that my time to-day is too limited to do justice to it, you would see for yourselves that the study, as well as the practice of aural-surgery, is no "narrow speciality," as some men, speaking out of the fulness of their ignorance, have ventured to call it. Indeed, it is quite otherwise than "narrow," and it must be so, for the field in which the aural-surgeon works is not limited by the dimensions of the organ, whose diseases he specially treats, but is co-extensive, I venture to say, with the whole organism. Nor need I, in proof of this statement, remind you of that which, I am sure, you already well know, viz., that in disease as in health our body is an indivisible whole, and "man is all symmetry."

"Each part may call the farthest brother,
For head with foot hath private amity,
And both with moons and tides."

In bringing these introductory remarks to a close, I wish to tell you something of the programme of our study during this session. As you know, the time at my disposal for lecturing is very limited, and it is therefore impossible to overtake the whole subject of aural-surgery in the course of one short summer session. Therefore I shall limit my course of lectures this session to a consideration of the pathology of the diseases of the ear, illustrated by practical remarks in regard to the causation, diagnosis, and treatment of these diseases. On Thursdays, therefore, at 4 P.M., I shall lecture here on aural-pathology, until I have exhausted this very important as well as interesting subject.

But I hope, also, after having finished it, to lecture to you on the diseases of the ear in infancy and childhood before the session terminates—a subject whose importance to you in your future careers as general practitioners you may be able to estimate, after the remarks that I have made to-day in an earlier part of my address. In the Dispensary, on the Tuesdays and Fridays, at 4 P.M., for one hour each day, I shall illustrate my systemic teaching by practical and clinical instruction and observations on the cases that come before us for treatment there, where ample opportunity will be given you of studying and of observing the processes of nature as they manifest themselves in the diseases of the ear.

There I hope, as your teacher and the interpreter to you of these phenomena of disease, to help you to an understanding of the affections of the apparatus of hearing. Not, however, aiming to make you specialists, these make themselves by a process of "natural" or other selection, and are only thus or never made—perhaps even, like the poets, never made at all—but born as such. What my aim shall be is this:—To instruct, so that you shall, in your future careers, be able to diagnose and to treat an ordinary case of ear-disease with credit to yourselves and good results to your patients. To teach you, also, how far in the conduct of a case you may go with safety to your patient, and with credit to your own reputation; and when, owing to its gravity or other causes, you ought to resign such a case into the hands of the more experienced special practitioner; in other words, to teach you so that you may see clearly the point in the treatment of any case of ear-disease at which your knowledge of it ends, and your ignorance begins; and if I succeed to this extent in my labours, and if you act thus, then without the smallest affectation I may say—"Bene erit opera posita."

Finally, gentlemen, let me remind you that, as the object and the end of our life in this world is to live for others, and not unto ourselves, our power for good in respect to others must be limited, as well as conditioned, by the spirit in which we come to the acquisition of this knowledge and of all other knowledges. If you, therefore, acquire this knowledge in a spirit of self-seeking and regardful of your own interests, then must all your future actions be determined and affected by this self-regard, and your whole life will be a lie. If you live in such a spirit then are you just as good as dead. And although you possessed all knowledges, and knew all mysteries, yet are you enveloped by the deepest darkness, and filled with the grossest ignorance; therefore escape from so great damnation.

In getting your knowledge, make your own welfare and your own well-being no part of your regard—you get to give. If you get in this spirit, then will your giving be divine-like in its nature and influence, for it must shed abroad upon the world a fragrance and a blessing which will make it a living world to you. Therefore have no concern as to the results of your giving in regard to yourself, for all must be well with you when you give, regardless alike of self and self-interest.

And is this not a glorious privilege, to minister to the needs of others regardless of ourselves, and without a thought of our going right, or a hope of coming at last to something as the result of our giving—giving, hoping for nothing in return. To give thus is to escape from the dead-life that envelops most of us in this world.

And I have to remark, that this privilege is a glorious and a sacred heritage to our profession. To the humblest as well as to the most exalted member of our art—the art of healing—this ministry of good, is a personal possession and a luxury without the limits and beyond the fetters of ethical or other laws. To minister to the sick in body, and to bring comfort to the broken in spirit; to give hearing to the deaf, and speech to the dumb; to give sight to the blind, even to give ourselves that we may help others, as our Great Archetype did, who did all these things, is our sacred right and trust.

Let us then thank God that the end of all thought, of all effort, and of all labour in this world is this self-regardless ministry to "other's needs"—for it is a glorious and a satisfying life—a life of love, boundless as it is bondless, "voyaging over an ever-deepening channel into an infinite sea."

ARTICLE VI.—*The Sewage Question.* By ANDREW FERGUS, M.D. Glasgow.

(*Continued from page* 1110 of Vol. xxiii.)

IN last number I pointed out where, in constructing a house, the water-closet ought to be placed with a view to its perfect ventilation, and shall now consider the various ways by which the sewage is at present conveyed through our houses, till it enters the main drain—a matter which has not received the attention it deserves from architects and builders, or, indeed, the public at large. Sufficient vigilance does not seem to be exercised over the parties entrusted with the laying of these internal fittings of houses, and as a result their imperfections are a continual source of annoyance and nuisance, not unfrequently the origin of disease and death. Let us shortly state some rules which ought to be observed:—First, the main soil-pipe should be of iron, well covered with protecting composition—iron, as I demonstrated in my last article, being preferable to lead, on account of the liability of the latter to decay. This main soil-pipe, instead of being hidden in a corner as is generally the case, should be so placed that at all times it could be inspected without trouble. It should pass up in its full diameter quite to the roof, and if it is not also the rain water-pipe, it should project beyond it. At the top it may be fitted up with a cowl and Archimedian screw, to cause if possible an up-current of air. It should be carefully placed, and well supported, so that it may not be liable to subside and so injure some of its connexions. Wherever there is a connexion, great care should be taken to have it firm and well made, and when at all possible the junction should be exposed to view. All traps connected with baths, water-closets, sinks, or fixed basins should be ventilated to the open air, and no pipe from any bath, sink, or fixed basin should ever pass into the trap of the water-closet, as the heated water promotes decomposition. Moreover, the overflow-pipe from the cistern should not open into the soil-pipe, as foul air may pass up and impregnate the water; it should rather be carried to the outside of the house, and thus secure a double advantage by keeping the water free from any possibility of evil from sewer gas, as well as by showing at once when the ball-cock of the cistern was not in action.

That portion of the sewer or soil-pipe which leads from the main descending soil-pipe, and is frequently laid underground in the basement story, is another thing which has by no means received the attention which its consideration requires. We generally find it covered over with asphalte or some other impervious material, and from this two evils arise:—*1st*, We cannot inspect it easily so as to be satisfied that it has been well constructed; and, *2d*, If any nuisance does arise from defect in the pipe, we are unable to detect the exact spot. The offensive smell, not finding external egress at the faulty point, travels underground, sometimes for long distances before it can escape. The requisites for safety in this department are—*1st*, That these pipes be laid in firm earth, so that they cannot at any time subside; *2d*, That the fall be sufficient to prevent any lodgement. When one pipe opens into another it should be from smaller to larger, and the opening should be obliquely in the direction of the flow of the current into the sewer; *3d*, It would be an additional security to lay all pipes in the basement floor in a built tunnel with movable covers at intervals so as to admit of free inspection; *4th*, That all jointings be most carefully made; *5th*, That when pipes are passed through walls, they should be prevented from all possibility of pressure by the subsidence of said walls, and this can best be done by building an arch where the pipes pass through, and leaving a space between the archway and the pipe; *6th*, A complete plan of all the drains and their connexions should be prepared and given with the title-deeds of every house.

Having now by this main-pipe got sewage out of the house, let us devote some space to the consideration of trapping, it being universal to interpose a trap or cesspool between the house drains and the sewers. It has always been supposed that by means of these, sewer gases were excluded from our houses, and that they were therefore a great sanitary benefit. No water-trap, however, can do this, as I have already clearly proved by the experiments related in my last article, that gases pass through water, and, indeed, traps were originally designed—not to keep out gas, for in these days sewer gas was not thought of—but to keep out vermin. As in other departments of this question, the matter to be dealt with was little studied and still less understood, many people to this day supposing that when they flush the water-closet all the fæcal matter is swept away from the premises into the main drain. Such, however, is not the case; in all cesspools, all tongue traps, all siphon traps there is a lodgement of fæces—often in an active state of decomposition—on the house side of the trap. I have made special investigation on this subject, and have never yet examined any trap in which I have not found a lodgement of fæces on the house side. The fact that fæces are not heavier than water has not been noticed, or it would at once have been seen that water could not remove them, and that in cesspools and deep traps of all kinds they can only pass away when disintegrated, and partially or wholly decomposed. Two points of considerable importance may be noticed here—1*st*, Some of the mere mechanical evils of our present system; and, 2*d*, The probable effects resulting from the use of disinfectants. In considering the first point, I do not intend to dwell on the injurious result to health caused by ignorance, carelessness, and bad workmanship, but merely wish to point out some defects very commonly met with even in houses of the highest class. 1*st*, The main descending soil-pipe is often so badly secured that it is liable to sink and break the connexions. 2*d*, The joints and joinings are often badly made, allowing, in some cases, fluid to escape, but more frequently merely the impure air, which is more dangerous, being much less likely to be discovered. Fluid leakage soon attracts attention, but an escape of gas may go on for a long time and baffle the inspection of skilled workmen. By way of discovering whether the pipe is perfectly air-tight, it has been proposed to pass a column of smoke through it by burning moist hay, or some other material causing dense smoke, at the bottom of the pipe. If there is no escape of smoke, it may be considered secure. 3*d*, The walls of houses are sometimes tunnelled so as to form part of the soil-pipe.[1] 4*th*, Glazed earthenware pipes are often so badly made, and of such bad material, that they very readily give way. Even when made of the best material, they are frequently broken from being laid on soft and irregularly yielding earth, for when any superincumbent pressure occurs, they give way. When a pipe passes under a wall, it should, as I have already pointed out, be protected by an arch being built over it. *5th*, The joinings of glazed pipes are frequently very imperfectly made. Some years ago, in a house supplied "with all modern improvements," I perceived the smell of sewer gas, and advised the occupants to have this attended to, and remedied. There were only two children in the family, and some time afterwards I was called to see them both, and found them very ill—in fact, poisoned by sewer gas. I ordered their immediate removal, which was accomplished in an hour or two, and which was followed by complete and rapid recovery. On examining the pipes it was found that they had been joined merely with clay, which had been removed by water or rats, and as the drains entered an old watercourse, there was a free discharge of sewer gas into the house. Another fault in an opposite direction is to use a large quantity of cement carelessly, so as to cause a deposit in the inside of the pipe. I have in my possession a joining where two-thirds of the whole internal diameter is filled up with a mass of mortar. This could be prevented, or, at least, mitigated, by drawing a plug the full diameter of the drain through each joining as soon as it was made, so that all superfluous mortar might be removed. So far as I can remember, I have never yet inspected a house where I found the soil-pipes and drains in a satisfactory condition.

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[1] In a house worth upwards of £5000, by an original faulty arrangement, the soil-pipe had to pass through the wall of the dining-room. To scamp the work, the soil-pipe came down to the place where it had to pass through, and was fastened there. The wall was then tunnelled, and a pipe connected to the other side of the tunnel, thus making the porous wall part of the soil-pipe.

Before entering on the subject of disinfectants, I must recall the attention of my readers to the fact already mentioned (p. 1107, vol. xxiii.), that there is always a mass of matter left on the house side of every trap, and every bend of a water-closet trunk or pipe, and that to have complete disinfection there must be as much of the disinfectant used as will disinfect not merely the suspected matter, but also all the organic matter already in the trap, and that may from time to time be added thereto. The use of the numberless disinfectants so freely advertised often proves "a mockery, a delusion, and a snare." Those who use them think themselves protected, while in reality not one tithe, not one hundredth part, of the organic matter is rendered antiseptic, or so thoroughly oxidized as to become innocuous. The terms disinfectant, deodorizer, and antiseptic are very much jumbled in the minds of many people. An organic substance may be rendered both inodorous and antiseptic without being of necessity disinfected; and it may, on the removal of the antiseptic influence, resume all its organic properties, quoad putrefaction, and by inference, infectiousness. A very familiar instance of this on a large scale may be given. There is now a great trade in fresh animal food from America. On the voyage it is kept cool either by ice or some other process, and there is no decomposition, cold being a powerful antiseptic. As soon, however, as the cold ceases—either by the voyage ending, or, as has happened, by the supply of ice running short—the meat resumes its old state, and decays sooner or later, according to the temperature. I cannot do better than quote some of the inferences bearing on this subject which Dr Baxter draws from a number of careful experiments which he made:[1]—

"1. Evidence has been adduced to show that carbolic acid, sulphur dioxide, potassic permanganate, and chlorine are all of them endowed with true disinfectant properties, though in very various degrees.

"2. It is essential to bear in mind that antiseptic is not synonymous with disinfectant power; though, as regards the four agents enumerated above, the one is, in a certain limited sense, commensurate with the other.

"3. The effectual disinfectant operation of chlorine and potassic permanganate appears to depend far more on the nature of the medium through which the particles of infected matter are distributed than on the specific character of the particles themselves.

"4. When either of these agents is used to disinfect a virulent liquid containing much organic matter, or any compounds capable of uniting with chlorine, or of decomposing the permanganate, there is no security for the effectual fulfilment of disinfection short of the presence of free chlorine or undecomposed permanganate in the liquid after all chemical action has had time to subside.

"5. A virulent liquid cannot be regarded as certainly and completely disinfected by sulphur dioxide unless it has been rendered permanently and strongly acid. The greater solubility of this agent renders it preferable, *cœteris paribus*, to chlorine and carbolic acid for the disinfection of liquid media.

"6. No virulent liquid can be considered disinfected by carbolic acid unless it contains at least two per cent. by weight of the pure acid.

"7. When disinfectants are mixed with a liquid, it is important to be sure that they are thoroughly incorporated with it; that no solid matters capable of shielding contagium from immediate contact with its destroyer be overlooked.

"10. When the thorough disinfection of a mass of solid or liquid matter, through which a contagium is disseminated, is impracticable, we should guard against giving a false security by the inadequate employment of artificial means. It is probable that all contagia disappear sooner or later under the influence of air and moisture, and that the absence of these influences may act as a preservative. When, therefore, we cannot advantageously or effectually supersede the natural process of decay, we must be sure that we do not hamper it by the injudicious use of antiseptics.

The latest experiments with which I am acquainted are those of Dr John Dougall, who read a paper before the Philosophical Society of Glasgow on 20th February 1878. After referring to Dr Baxter's fourth conclusion, he says—

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[1] Reports of the Medical Officer of the Privy Council and Local Government Board, 1875, pp. 254, 255.

"As this conclusion, which is founded on a great number of very interesting experiments, seemed a safe basis for testing further, in an easy and very practical manner, the disinfecting power of the permanganate, I resolved to try, in the form of Condy's fluid, its strength with enteric excreta, this fluid being the state in which the permanganate is almost exclusively used by the public. The experiment was conducted as follows:—To a newly-passed characteristic ochry-looking enteric stool, quantity unknown, a portion of a known quantity of Condy's fluid was added. The mixture was then stirred and set aside for a short time, and when the pink colour had changed to a brown, more of the fluid was added and the process repeated, till the pink colour was found permanent after the lapse of twelve hours. In other words, chemical action in the mixture had subsided, as indicated by the presence of the undecomposed pinkish permanganate liquid. The mixture was now measured, and the quantity of Condy's fluid used being known, this was subtracted from the whole, thus showing the amount of fæcal matter acted on. To find the exact relation between the quantity of Condy's fluid deoxidised and the amount of enteric fæces disinfected was now a simple matter of calculation.

"Avoiding fractions, it amounted to this (and I confess the result astonished me), one ounce of the enteric fæces had deoxidised not less than ten ounces of Condy's fluid; in other words, there is no security that enteric fæcal matter is effectually disinfected by Condy's fluid, except the bulk of the fluid used is ten times as great as the bulk of the enteric fæces to be disinfected.

"In the same manner I experimented with a fluid ounce of enteric urine, and here the result was, that one ounce of the urine deoxidised at least two ounces of the Condy's fluid.

"Now, supposing a typhoid patient passing 12 ounces of fæcal matter and 20 ounces of urine during each 24 hours, say for a week, which it will be conceded are not excessive quantities, and supposing the Condy's fluid sold to the public in 8-oz. bottles at 1s. each is used, it follows that 280 ounces of Condy's fluid are required to oxidise or disinfect the week's urine, which at 1s. per 8 ounce amounts to £1, 15s., and that 840 ounces are required to oxidise or disinfect the week's fæces, which at 1s. per 8 ounces amounts to £5, 5s., in all £7 per week, or at the rate of £364 per annum. Now, supposing an hospital with thirty enteric patients on an average constantly under treatment, on these data it would take £10,920 worth of Condy's fluid to disinfect their yearly excretions."

In considering the disinfection of excreta, some points must be kept in view. We must remember that they are in general mixed with a large quantity of water, and that in estimating the quantity of disinfectant to be used, we must recollect that the whole liquid must be acted upon (Dr Baxter's fourth, fifth and sixth conclusions). The seventh and tenth are of special importance when considering this question, especially when dealing with large masses.

One point has not yet been clearly demonstrated, and yet a very few experiments might do so, viz., suppose you have rendered a virulent liquid antiseptic and sterile by chlorine, sulphurous, or carbolic acid, but have not added enough to deoxidise it, what will happen? We know that all these are volatile; what effect will result from exposure to the air? Is it possible that after a time putrefaction may take place? If so, and if we incline to the germ theory of disease, then we have no security that we have destroyed the *germs* of disease. We may merely have preserved them, to break out with all virulence at a future time. I think it is quite possible to add an antiseptic to a virulent liquid until all trace of living organism is destroyed, and yet I do not think we can be sure that we have destroyed the germs of these lowest order of beings. No doubt, all the living have perished, but we know too little of their germs to assume that these have been destroyed, *i.e.*, rendered incapable of development when they meet with their appropriate nidus.

(*To be continued.*)

TRIAL OF CHANTRELLE.

EDINBURGH has of late years been famous for its trials for poisoning, and, with the exception of that of Palmer, the English Courts have had none to compare in interest with those of Madeline Smith, Pritchard, or Chantrelle. The romance connected with the first of these, the fact that the accused was a young lady, and that she was charged with using one of the most popular and easily-detected poisons, which she had bought openly, and, in doing so, had come under all the requirements of a special Act regulating the sale of arsenic, sufficiently account for the popular excitement. The cases of Pritchard and Chantrelle, on the other hand, closely resembled those of Palmer and of De Pommerais in France. All of those criminals made use of their special professional knowledge to commit their crimes, and to throw justice off the scent by their mode of administration of poisons, which could not be obtained by a non-professional person without great difficulty. Strange to say, the very precautions they used told against them, and adepts although they considered themselves to be, they were found guilty, and suffered the extreme penalty of the law; while the woman, unskilled in medicine and in the knowledge of poisons, escaped conviction by our Scotch verdict of not proven.

We had intended to lay before our readers the medical evidence *in extenso* in this latest trial, but we found that too much space would have been occupied. It is, moreover, unnecessary, as the newspaper press reported the trial with more than usual fulness, and gave especial prominence to the medical reports, which were printed *verbatim*. In the following *resumé* the quotations from the evidence are taken from the extended notes prepared for the Crown.

The theory of the prosecution was, that the poison employed was opium in the form of extract. Let us see how far this was supported by the general evidence of poisoning, and

1. *With regard to the Symptoms observed during Life.*—Madame Chantrelle was in her usual state of health up to Tuesday 1st January. On this morning her appearance was apparently unchanged; she took, however, less breakfast than usual, and stated to her servant "that she did not feel very well; that she had a little touch of headache, but nothing to signify." She was able to perform her household duties, and was not seen again by the servant (who was out for the day) till the evening, about ten o'clock. Her little boy Eugene, who was with his mother during the day, stated that "she said she was ill, lay down on the sofa, and vomited a watery fluid. She brought in the dinner that afternoon, but she did not partake of it, and during it left the table for the sofa. She attended to her baby, two months old, and went to bed with it about six o'clock." She was seen in bed by Eugene about half-past nine o'clock, when "she looked her usual, and said she was a little better." To the servant, who returned at ten o'clock, Madame Chantrelle "did not seem to be very well-looking." She was in bed and appeared very heavy-looking, but in answer to a question said, "I am a great deal better than what I was since I lay down and got a rest." "She spoke in her natural tone, and did not look to be very ill at all at that time." During the day and evening she had had oranges, grapes, and lemonade. Between twenty and ten minutes to seven o'clock next morning the servant (Byrne) left her bedroom, which was on the upper flat of the house and on the same landing as the bedroom of her mistress, and went downstairs to the kitchen, on the under floor. After a little time, on crossing the lobby, she heard a moan—a second was heard almost immediately afterwards, and on going upstairs to Madame Chantrelle's bedroom a third moan was heard. She entered the room and found her mistress in bed "moaning very heavily." "She was very pale-looking—awfully pale-looking. Her eyes were quite closed." Madame Chantrelle made no answer to repeated questions. The servant shook her repeatedly without effect. "When I shook her she did not open her eyes at all, nor did she speak at all; she just moaned." The servant then roused her master and returned to her mistress, whose hand she shook strongly, "but she only moaned, and I got no answer from her. She still had the paleness of which I have already spoken." The servant thought that her mistress "was dying," and urged upon her master to go for a doctor. Chantrelle went for Dr Carmichael, who saw Madame about half-past eight, found her in bed "look-

ing very ill, her complexion very pale, her eyes shut, and her respiration very much impeded," "three or four respirations occurring about every two minutes." She was profoundly unconscious. Madame was removed into the front bedroom, and then Dr Carmichael examined her more particularly. The eyes "were still closed, the pupils were very slightly contracted, immobile, and quite insensible to light. There was vomited matter escaping from the pendent side of the mouth, oozing out upon her chin and cheek. I took a piece of what I believed to be orange pulp out of her mouth." The chief reason for Dr Carmichael insisting on removing the patient into the front bedroom was the strong smell of gas which he felt on entering Madame's room. The smell of gas was strong, although the window was open to the extent of half-a-foot from the bottom. Dr Carmichael now requested the assistance of Dr Littlejohn, and that gentleman reached the house about half-past nine o'clock. Madame Chantrelle was in much the same state as spoken to by Dr Carmichael. Dr Littlejohn did not make any minute examination of the patient, but he substantially agrees with the evidence of Dr Carmichael. Dr Littlejohn, knowing something of the unhappy relations of this husband and wife, was anxious to have Madame Chantrelle removed to some place where she could be treated without being exposed to the surveillance of her husband. Certain circumstances had, however, powerfully excited the suspicions of the two medical men—1*st*, The fact that M. Chantrelle could not point out the site of the escape of gas, although he said it had occurred before; 2*d*, The fact that, while pretending to be well acquainted with the action of medicines and poisons, he had actually allowed his wife to remain in the bedroom, exposed to the vapour of coal-gas, while he went for the doctor; 3*d*, That Madame's bedroom had a new smoke-board accurately fitted to the chimney. It afterwards transpired that this board had been placed there by him, although his wife strongly objected to it. While the medical men had thus their suspicions aroused, they were inclined to regard the case as probably due to gas-poisoning, but they were the more determined to insist on the removal of the patient to the Royal Infirmary. Both regarded the case as hopeless, and Chantrelle was told so. The wife's friends were at once communicated with, and the family physician, Dr Gordon, came with them, and examined Madame Chantrelle about half-past eleven o'clock. Her condition was unchanged. She was almost pulseless. "The pulse was almost imperceptible; the eyes were shut, the pupils natural or nearly so." Dr Gordon remained till one o'clock, when Madame Chantrelle was removed to the Royal Infirmary. Dr Maclagan, who was acting as Professor of Clinical Medicine, saw her about a quarter to two o'clock. "She was lying on a bed, totally insensible, with the muscles relaxed, the eyelids closed, the pupils somewhat contracted and insensible to light. She was incapable of being roused, respiration interrupted, and the heart's action hardly discernible. The pulse at the wrist was not to be felt." Dr Maclagan remained with her for about an hour, and, on returning shortly after four o'clock, found that the patient was dead.

The treatment throughout consisted in the steady application of artificial respiration. Two enemata of brandy were administered, one by Dr Carmichael and the other in the Infirmary, and the interrupted galvanic current was also used there.

2. *The Post-mortem Appearances.*—The examination was made next day at one o'clock. All the important organs were found to be perfectly healthy. Menstruation was present. Drs Maclagan and Littlejohn reported that "they failed to discover any cause of death." They accordingly removed various fluids and organs for the purpose of analysis.

3. *The Chemical Analysis.*—This inquiry, which was conducted by Drs Maclagan and Littlejohn, was also negative, with a slight but remarkable exception. "We found," say the reporters, "no poison, vegetable or mineral, in the cavity of the alimentary canal or in the tissues or fluids of the body of Madame Chantrelle, except a dubious or at most a very minute trace of chloral in the tissues of the stomach."

4. *The Various Stains.*—The servant (Byrne) observed "vomitings on the corner of the pillow-cover," when she found her mistress insensible. "I observed," she says, "nothing on the sheet of the bed till the Saturday night. On the Friday night I turned the sheets upside down, and never minded. J. W. Dyer (brother of the deceased), was going to remain in the house on the Saturday night, and I was going to put clean sheets on the bed. I then observed vomiting on the corner of the sheet next the door at the head of the bed. The bed was never made till that Saturday night. I made the bed on New-year's morning. There were no stains or vomiting on the sheet or bed that morning."

Dr Carmichael "observed marks of vomiting on the pillow or bolster, and also upon the sheet, and slightly upon the night-clothes of the deceased."

Dr Littlejohn "noticed on the bolster-slip evident marks of vomiting having recently occurred."

Mary E. Lethbridge, nurse in the Royal Infirmary, when Madame Chantrelle died, "took from her her night-gown, chemise, and slip-body. I did not observe any stains on the night-gown till I examined it in presence of the detectives. I put the articles carefully away into a place by themselves, into a press, which I locked. The officers came on Monday, 7th January, and I then gave the articles up to them. I observed on the night-dress stains of vomiting of apparently two different characters. These were on the neck, at the very top. One was a yellow stain, as if an orange had been eaten, and saliva had been vomited with the orange. The other was a dark vomit—very dark. It was at the back of the left shoulder. There was nothing like the dark brown stain I saw on the night-gown either on the slip-body or on the chemise."

All the stained articles were handed to Drs Maclagan and Littlejohn, and the various stains are thus described by them:—

1. *The Bolster-slip.*—"This showed a defined but feebly-tinged stain, 15 inches long by 10 broad, having fragments of orange adhering to it. No poison was detected.

2. *The Sheet.*—"On this there was, within 4 inches of one of its edges, an irregularly square-shaped stain, 12 inches each way, with grape-seeds and fragments of orange adhering to it. Close to this stain, at the margin farthest from the edge of the sheet, there was a brown mark, about 3 inches long and 1½ broad, consisting of irregular but well-defined patches of a dark-brown matter, stiffening the cloth, which had been applied to the same side of the sheet as that to which the fragments of orange and grape adhered.

"This dark-brown stain yielded a brown solution which, when gently warmed, had a feeble but distinct smell of opium, and it had a bitter taste, and gave freely, with perchloride of iron, the reaction of meconic acid, and with iodic and sulphomolybdic acids, the reactions of morphia.

3. *The Night-gown.*—"On the upper and back part of the left shoulder there were diffused stains with fragments of orange adhering, but no grape-seeds were noticed. Near these, at the part corresponding to the left shoulder-blade, there was a defined stain 1¼ inch square, where the cloth was stiffened by a dark-brown somewhat glistening substance, which had obviously been applied to the outside of the cloth in a soft, solid state. In the middle of this stain was a small globular mass of a dark-brown colour, which, when picked off, was found to weigh $\frac{3}{10}$ths of a grain. Around the defined stain the cloth was marked by a brown ring apparently resulting from this brown matter having been in contact with fluid. The stain, on maceration, gave a solution having the odour and taste of opium, and which gave strongly the reaction characteristic of meconic acid.

"The small globular mass picked off from the stain was treated in a similar manner. It gave a brown fluid having the taste and odour of opium, and which gave not only the reaction of meconic acid, but the reactions of morphia with iodic and sulphomolybdic acids."

As the result of this chemical examination, the reporters stated "that on the sheet and bedgown we found indisputable evidence of the presence of opium, apparently in the form of extract, and that, in each case, this opium was accompanied by portions of grapes and orange, the substances which we recognised in the contents of the stomach."

An independent and corroborative analysis was made by Professors Crum Brown and Fraser of portions of various fluids and organs which had been removed by Drs Maclagan and Littlejohn from the body of Madame Chantrelle, and also of portions of the various stains on the night-gown and sheet.

These chemists stated that "in separating morphia from the above-mentioned articles, we employed the process of Stas, and also the process in which morphia is separated from acids and other substances by means of acetate of lead. By the latter process meconic acid was precipitated from the solutions containing it in the form of a lead salt, and afterwards separated from lead by the action of sulphuretted hydrogen."

The urine removed from the body of deceased was tested by Drs Maclagan and Littlejohn "for chloral, but no evidence of its presence was obtained." Professors Crum Brown and Fraser, in addition, found that the urine "had a faintly-alcoholic odour," and, by appropriate tests, they "proved the presence of alcohol in considerable quantity."

Such was the strictly professional evidence which justified the Crown in affirming that Madame Chantrelle had not died from natural causes—that she had been poisoned, and that the poison was in all probability a preparation of opium. The circumstantial evidence was of the strongest kind against the prisoner. It was proved—1*st*, That for years he had ill-used and neglected his wife; 2*d*, That he had threatened her life by poison; 3*d*, That, in the month of October 1877, he had insured her life in an Accidental Insurance Company for £1000, against accidental death alone; 4*th*, That he possessed a stock of medicines and poisonous substances, among which were chloral and extract of opium, and that so recently as 25th November 1877 he had purchased one drachm of extract of opium; 5*th*, That the box in which this extract was sold was never recovered, and that its absence was not accounted for by the prisoner.

For the defence it was urged—1*st*, That the true cause of death was the inhalation of coal-gas from an escape in Madame's bedroom; and, 2*d*, That the evidence of the Crown that opium was the poison was not supported by the symptoms during life, nor by the chemical analysis.

1*st*, *As to the Escape of Coal-gas.*—When Drs Carmichael and Littlejohn saw Madame Chantrelle, and felt the smell of gas in her room, they understood that the gas had been escaping from some orifice or other during the night, and that when Mary Byrne discovered her mistress lying insensible, the room at that time was full of gas. Had these gentlemen been aware that when the servant rose that morning no smell of gas was discernible in any part of the house, and that when hearing the moans of her mistress she went upstairs to the bedroom and found her totally insensible, and apparently dying, and that no smell was perceptible in the staircase, lobby, or in the bedroom itself, they never would have entertained the notion that the symptoms of Madame Chantrelle were due to the escape of gas. As it was, the impression on their minds was that the case was one of narcotic poisoning, that while the symptoms might be due to the inhalation of coal-gas, yet, from their experience of cases of poisoning with opium, that the symptoms closely resembled those resulting from an overdose of this narcotic.

In the presence of Drs Littlejohn and Carmichael, Chantrelle attributed the illness of his wife to an escape of gas in her bedroom, and when these medical men failed to detect any leakage, he hinted that possibly the gas might have escaped through the seams of the floor. During the morning, the odour of gas, which presented a remarkable intermittent character, was manifest in the house, and the breath of Madame Chantrelle was, as stated by Dr Carmichael, tainted with it. The window of her bedroom and the doors were kept open, and the odour quickly disappeared. At least, when an officer of the Gas Company came a little after ten o'clock, he could detect no smell of gas in any part of the house, and the site of the leakage was not discovered, as the officer, finding that the site of the leakage must be within the house, considered it no part of his duty to attempt to do so. On Friday, 4th January, a more careful investigation was made. The gas was turned on at the meter, and a leakage of gas was at once indicated. The gas was now turned off, and on the officers of the Gas Company going upstairs, "a slight smell of gas" was felt on the top of the stair leading to Madame Chantrelle's room, and in that bedroom "the smell was strong." Continuing their search, a place was noticed in the architrave of the window where a bracket had formerly been. On opening the shutter, the pipe which had supplied this bracket was found to be broken completely across, and the torn or broken end was lying loose on the ledge at the bottom of the shutter. Experiments showed that no accident could account for this breaking of the pipe, which was what is called in the trade "composition pipe," and could only be broken by two turns, "back and forward." With this movement the pipe could be broken "very rapidly." This, there could be no doubt, was the source of the escape of gas. Chantrelle, on the broken pipe being shown to him, stated "he was not aware there was a gas-pipe behind the shutter, and could not account for the pipe getting broken. He had never used a bracket at that place," although it was proved that in August 1876 an escape of gas took place from a leak in the end of the very pipe which was now broken. The hole in the pipe, which was about the size of a pin's point, had actually been closed in Chantrelle's presence.

At seven o'clock on the fatal morning the gas-pipe was unbroken. As we have said, no smell of gas was perceived by Mary Byrne when she burst into her mistress's room and found her insensible and dying. The bedroom door was half open (an unusual circumstance), and had any escape of gas been taking place previously, it would have passed from the bedroom into the lobby, and would at once have attracted attention. Mary Byrne now awoke her master. After he looked at and spoke to his wife, "he said he thought he heard the child crying, and that she—the servant—had better go and see what was the matter with it." "I went to the nursery," says Mary Byrne, "and found the child asleep. I shut the door behind me and returned to Madame's room. I found M. Chantrelle coming from the window, which he had raised up from the bottom. I did not see him open the window, but it struck me very much that I had left him sitting on the side of the bed when I went out, and to see him coming from the window when I went back. He then asked me, Did I observe any smell of gas? and I said No, nothing that I could observe. I had never perceived any smell of gas that morning. I felt a very slight smell of gas immediately after he had put the question. He sent me down to turn off the gas at the meter. I went down and turned it off. The meter was in a closet under the stairs on the first floor. During the time I was in the house the gas was never turned off at the meter, to my knowledge, except once. It was on when I went down to the meter on the morning in question, and I had lit it in the kitchen when I went in to light the fire." After turning the gas off at the meter and going upstairs, Mary Byrne states distinctly, "I felt a little smell as if gas had been escaping;" and, at her solicitation, M. Chantrelle went to call for Dr Carmichael, leaving his moribund wife in the very apartment in which he had put the question to his servant, "Do you observe a smell of gas?" Chantrelle was absent from his home for half-an-hour. During this time the window and door of Madame's bedroom were open, and the meter was not touched by Mary Byrne until Dr Carmichael's arrival, when, at Chantrelle's request, she turned the gas on at the meter. Dr Littlejohn was then sent for.

That Chantrelle had an opportunity of breaking the gas-pipe there can be no doubt, and there can be as little that the escape of gas was a mere feint to withdraw attention from the serious symptoms of narcotic poisoning under which Madame undoubtedly laboured. No distinctive symptom of coal-gas poisoning was present; but, at the same time, some of the symptoms usually regarded as characteristic of poisoning with opium were absent,—there was no marked contraction of the pupil, and the skin showed little or no sign of perspiration. There was, however, the profound coma, the complete relaxation of the body, and a peculiar pallor, which so impressed Dr Maclagan, who, since Dr Taylor's retirement from the active duties of medico-legal practice, must be regarded as our greatest authority in poisons, that he said to his students, "I don't think this is a case of gas-poisoning. It appears to be a case of narcotic poisoning, possibly by opium, or possibly morphia, for I can't smell any laudanum on the breath. That was my diagnosis at the time."

All the medical gentlemen who saw the case during life concurred in this view, and gave their evidence accordingly.

No medical evidence was produced by the defence in support of their hypothesis that gas-poisoning was the cause of death; but in the cross-examination of all the Crown medical witnesses an attempt was made to show that the symptoms manifested by Madame Chantrelle might be explained by the inhalation of coal-gas. This attempt, in our opinion, completely broke down, but a more difficult question presented itself to the Crown witnesses, and which did not admit of a satisfactory solution. Granted that Madame Chantrelle was only exposed for a limited time to the inhalation of coal-gas after she was narcotized by some other poison, such as opium, what effect would the combination have on the symptoms usually produced by each of these poisons? It was impossible to say that the inhalation, however temporary, of coal-gas would not injuriously affect a person suffering from a fatal dose of opium. At the same time, it is a remarkable circumstance that life was so prolonged in this case. Madame Chantrelle was found dying at seven A.M. At no stage of the subsequent treatment did the slightest improvement show itself, and yet she survived till four P.M., a period of nine hours. This circumstance was taken advantage of by the defence, who argued that if the case was one of opium poisoning, recovery should have followed such a protracted illness, and that hence it was probable that some other poison than opium was the fatal agent.

This, however, was a dangerous line of defence, inasmuch as it accounted for the failure of the Crown to prove the presence of such a poison as opium in the body of the deceased, it being a well-recognized fact in toxicology that the longer the duration of a case of opium poisoning, the less likely will be the detection of the poison in the fluids and tissues of the body.

2. But the defence, not satisfied with starting this anticipated objection to the chemical analyses, went farther, and impugned their accuracy. Mr Falconer King, the city analyst, was the only chemist called to support this contention, and his evidence mainly went to show that the reactions of some of the tests mentioned in the chemical reports might be produced by other substances than the constituents of opium. It was stated that more tests than those mentioned in the Crown reports should have been given, and from the silence of these reports it was argued that certain tests had never been employed. Drs Maclagan and Littlejohn obtained the opium—not in the crude state, but apparently as a dried extract—*in bulk*, and satisfactorily recognized it by its physical characters, viz., smell, appearance, and taste, and these were corroborated by what was regarded by these gentlemen as reliable tests. The morphia was not separated in the crystalline

form and the crystals were not submitted to microscopic examination. This was not considered necessary.

Professors Crum Brown and Fraser, on the other hand, having no opium in actual bulk to deal with, not only operated carefully on the various stains with Stas's process and separated the morphia, but also used the ordinary process of separating morphia by means of acetate of lead; and as a fact these chemists obtained morphia *in the crystalline form*, and *verified the crystals with the microscope.* The defence, however, put no question to these gentlemen as to the special tests which they employed.

Surely, if this defence was *boná fide*, and not a mere ruse to confuse the jury, it was incumbent on the prisoner's counsel and their sole witness, Mr King, to have examined—1*st*, the remains of the stains, fluids, and tissues, which had been specially reserved by the Crown for the purposes of the defence, if asked for; and 2*d*, the various stains, the greater portion of which was untouched and available for analysis at the hands of any person of skill selected by the defence. The chemical accuracy of the Crown witnesses was impugned. How easy by an independent analysis of these stains to have proved that mistakes had been made, and that the constituents of opium were not to be detected in them.

As some of the tests mentioned in the chemical reports are comparatively new, and their reactions with a variety of substances met with in the stomach has not been fully studied, we willingly availed ourselves of the intimate acquaintance possessed by Mr Brown, partner of the firm of Macfarlan & Co. of this city; and at our request he made various experiments with iodic and sulphomolybdic acid, etc., and which we regard as of so much importance as to justify us placing them on permanent record in these pages.

ACTION OF IODIC ACID, "SULPHOMOLYBDIC ACID," AND FERRIC CHLORIDE, ON VARIOUS SUBSTANCES.

Action of Iodic Acid and Starch on Morphia.—When $\frac{1}{2000}$th of a grain of muriate of morphia dissolved in a drop of water was moistened with a little starch paste, and a particle of iodic acid was added, a blue colour was instantly developed, which soon disappeared.

Action of Iodic Acid on Grape Juice.—The juice was simply squeezed from the fruit and a few drops mixed with starch paste, a crystal of iodic acid being then added. No colour appeared even after three hours. A quantity of the same juice was evaporated to dryness at the ordinary temperature over sulphuric acid, and the residue likewise gave negative results. The dry alcoholic extract similarly treated gave at once a dirty blue colour, which gradually disappeared. With the ethereal extract prepared by Stas's process no coloration could be obtained.

Action of Iodic Acid on Orange Juice.—Orange juice, with iodic acid and starch, gave a blue colour instantly. The dried juice behaved in the same way. No definite reaction could be obtained with the alcoholic extract, only a faint streak of violet generally appearing, which did not increase. The ethereal extract prepared by Stas's process had no effect on the iodic acid.

Action of Iodic Acid on Saliva.—Iodic acid and starch produce immediately with saliva a bright blue. This reaction takes place equally well with dried saliva. When the saliva has been mixed with acetate of lead, and the lead removed by sulphuretted hydrogen, the iodic acid reaction is much less distinct.

Action of Iodic Acid on mixture of Orange Juice and Saliva.—A violet colour is immediately produced. This reaction resembles that of morphia, but there is in this case no alteration in the colour, the blue tint not being developed.

Action of "Sulphomolybdic Acid" on Morphia.—$\frac{1}{1000}$th of a grain muriate of morphia gave immediately, with a drop of the sulphomolybdic acid, a rich purple colour, which rapidly disappeared, the liquid assuming a brown tint, which in turn passed into blue. This occupied fifteen minutes, and in half an hour the colour had altogether disappeared. The proportions of the reagents were varied, but the results did not materially differ. Free morphia deports itself in precisely the same way. The presence of water interferes with and may altogether prevent the reaction.

Action of "Sulphomolbydic Acid" on Grape Juice.—With no proportions could any coloration be obtained until the lapse of nearly half an hour, and then the colour was very faint and quickly disappeared. In the case of dried juice the reaction was practically the same. The alcoholic extract gave varying results, but the shortest time in which any trace of blue appeared was five minutes, the colour taking about ten minutes to spread through the liquid, and being of an obscure, dirty shade. The yield of ethereal extract by Stas's process was extremely small. It gave an evanescent, reddish tint with sulphomolybdic acid, which, however, did not develop into blue, except in one instance, when the colour appeared in a few minutes. It must here be noted, however, that in examining the product of Stas's process, there is no use in applying the molybdic test, unless special precautions have been taken to get rid of the alcohol, as the least traces of that fluid will reduce the molybdic acid, giving the same blue colour as if morphia were present.

Action of "Sulphomolybdic Acid" on Orange Juice.—No coloration was obtained with the fresh juice. When the dried juice was employed a faint blue made its appearance in from ten to fifteen minutes. With the ethereal extract of orange (Stas's process) no blue colour was produced.

Action of "Sulphomolybdic Acid" on Saliva.—With the natural saliva no reaction was obtained, but when it was evaporated to dryness and mixed with the molybdic acid, a slight blue colour appeared after the mixture had stood for more than thirty minutes.

Action of "Sulphomolybdic Acid" on a mixture of Orange Juice and Saliva.—No blue colour was obtained until about half an hour, and it was not distinct. A mixture of saliva and orange juice was evaporated to dryness and tested in the same way, with the result that the blue tint made its appearance in about twenty minutes, but was not very decided until some time longer.

Action of Ferric Chloride on Morphia.—A blue or bluish-green is produced, even with $\frac{1}{2000}$th of a grain.

Action of Ferric Chloride on Meconic Acid.—The wine-red tint is perceptible with $\frac{1}{12000}$th part of a grain, but that is about the limit of the reaction. The colour is very distinct with $\frac{1}{4000}$th of a grain.

Action of Ferric Chloride on Saliva.—A slight orange-red tint is produced both with the moist and dry saliva. This colour would not be mistaken for the wine-red of meconate of iron.

Action of Ferric Chloride on a mixture of Orange Juice and Saliva.—Nothing but an orange colour could be obtained either with the moist or dry mixture.

Action of Ferric Chloride on Vinegar.—Samples of white, brown, and French vinegar were tested, but perchloride of iron, however applied, failed to produce a red coloration. The residue from the evaporation of the vinegars was likewise tested with negative results.

Besides the experiments which have been detailed, mixtures of orange and grape juices, and of orange juice, grape juice and saliva, both in their natural state, and evaporated to dryness, were tested with the same reagents as were used in the other cases, but the results were just such as might be anticipated from the foregoing experiments, and it would be superfluous to give them in an extended form. In every instance several experiments were tried, and that giving the most decided reaction is the one described.

Granting that these stains were due to a preparation of opium, an important question was raised at the trial as to the proof of the stains having been due to vomited matters, and certain of the chemists were asked if they could positively identify these stains as having been caused by vomited matters. Drs Maclagan, Littlejohn, and Crum Brown said they could only speak to the general appearance of the stains as resembling vomitings; and Drs Maclagan and Littlejohn, in their report on the stains on the chemise, state that "around the defined stain the cloth was marked by a brown ring apparently resulting from this brown matter having been in contact with fluid." All doubts as to the nature of the brown stains were set at rest by the prisoner, who, after a trial of four days' duration, was found guilty of murder;

and immediately after sentence was pronounced, in a rambling address, said he allowed that it had been proved that opium in a solid form was present in the dark stains.

No hope of mercy was held out to him, and the last penalty of the law was carried out on Friday, 31st May.

Up to the Thursday morning, when the intimation arrived from the Home Secretary that the law must take its course, Chantrelle appeared to be careless of life, and indulged in continued bravado. The day before his execution, however, and subsequently on the morning of that day, a change came over him, and he acknowledged the many sins of his past life, but avoided reference to the crime for which he was about to expiate his life on the scaffold. As to this, he studiously refrained from declaring his innocence, and it was believed that, had longer time been allowed him, he would have been led to confess his guilt.

Part Second.

REVIEWS.

Fat and Blood: And How to Make Them. By S. WEIR MITCHELL, M.D., Member of the National Academy of Sciences; Physician to the Orthopædic Hospital and Infirmary for Diseases of the Nervous System; Fellow of the College of Physicians, Philadelphia, etc. etc. First English, from the Second American Edition. London: 1878, pp. 109.

THIS little work, dedicated to John Forsyth Meigs, M.D., in grateful remembrance of many acts of friendly service, deserves a careful and thoughtful perusal. It is not an ephemeral production, written with a view to practice and popularity, as small books often are; it contains an original idea carefully elaborated, and is the outcome of marked and unusual success already achieved in the treatment of a large class of puzzling cases. The cases referred to are chiefly nervous women, who, as a rule, are thin, and lack blood. For some years, as the author tells us, he has been using, both in private and in hospital practice, certain methods of renewing the vitality of such feeble persons by a combination of entire rest and of excessive feeding, made possible by passive exercises obtained through the steady use of what he calls massage and electricity.

The following sketch will convey to the experienced practitioner the kind of case which Dr Mitchell contemplates and seeks to relieve:—"A woman, most often between twenty and thirty, undergoes a season of trial, or encounters some prolonged strain. She undertakes the hard task of nursing a relative, and goes through this severe duty with the addition of emotional excitement, swayed by hopes and fears, and forgetful of self and of what every one needs in the way of air and food and change, when attempting this most trying task; or possibly it is mere physical strain, such as teaching. In another set of cases an illness is the cause, and she never rallies entirely, or else some local uterine trouble starts the mischief; and although this is cured, the doctor wonders that his patient does not get fat and ruddy again. But no matter how it comes about, the woman grows pale and thin, eats little, or, if she eats, does not profit by it. Everything wearies her—to sew, to write, to read, to walk—and by-and-by the sofa or the bed is her only comfort. Every effort is paid for dearly, and she describes herself as aching and sore, as sleeping ill, and as needing constant stimulus and endless tonics. Then comes the mischievous rôle of bromides, opium, chloral, and brandy. If the case did not begin with uterine troubles they soon appear, and are usually treated in vain, if the general means employed to build up the bodily health fail, as in many cases they do fail. The same remark applies to the dyspepsias and constipation which further annoy the patient, and embarrass the treatment. If such a person is emotional, she does not fail to become more so, and even the firmest women lose self-control at last under excessive feebleness. Nor is this less true of men; and I have many a time seen soldiers, who had ridden boldly with Sheridan, or fought gallantly with Grant, become, under the influence of painful nerve wounds, as irritable and hysterically emotional as the veriest girl. If no rescue comes, the fate of women thus disordered is at last the bed. They acquire tender spines, and furnish the most lamentable examples of all the strange phenomena of hysteria."

The author goes on to paint in vivid colours the moral deterioration in the form of self-love, selfishness, and loss of self-control, which often supervenes in such cases, if they are of long standing, and not wisely managed by judicious relatives and friends. A great additional barrier thus rises unconsciously to all parties in the way of successful treatment. "It is the self-sacrificing love and over-careful sympathy of a mother, a sister, or some other devoted relative. Nothing is more curious, nothing more sad and pitiful than these partnerships between the sick and selfish and the sound and over-loving. By slow but sure degrees the healthy life is absorbed by the sick life, in a manner more or less injurious to both, until, sometimes too late for remedy, the growth of the evil is seen by others. Usually the person withdrawn from wholesome duties to minister to the caprices of hysterical selfishness is the person of a household who feels most for the invalid, and who, for this very reason, suffers the most. The patient has pain, a tender spine, for example; she is urged to give it rest. She cannot read;

the self-constituted nurse reads to her. At last light hurts her eyes; the mother remains shut up with her all day in a darkened room. A draught of air is supposed to do harm, and the doors and windows are closed, and the ingenuity of kindness is taxed to imagine new sources of like trouble, until at last the window cracks are stuffed with cotton, the chimney stopped, and even the keyhole guarded. It is easy to see where all this leads to—the nurse falls ill, and a new victim is found. I have seen a hysterical anæmic girl kill in this way three generations of nurses. If you tell the patient she is basely selfish, she is probably amazed, and wonders at your cruelty. To cure such a case, you must morally alter as well as physically amend, and nothing less will answer. The first step needful is to break up the companionship, and to substitute the firm kindness of a well-trained hired nurse."

"Medical opinion," Dr Mitchell goes on to say, "must, of course, vary as to the causes which give rise to the familiar cases I have so briefly sketched. In fact, they vary endlessly; but I imagine that few physicians placed face to face with such cases would not feel sure that if they could give the patient a liberal gain in fat and in blood they would be certain to need very little else, and that the troubles of stomach, bowels, and uterus would speedily vanish. Such certainly has been the result of my own very ample experience. If I succeed in first altering the moral atmosphere, which has been to the patient like the very breathing of evil, and if I can add largely to the weight and fill the vessels with red blood, I am usually sure of giving relief. If I fail, it is because I fail in these very points, or else because I have overlooked or undervalued some serious organic tissue change."

"The treatment I am about to describe consists in seclusion, certain forms of diet, rest in bed, massage (or manipulation), and electricity; and I desire to insist anew on the fact that it is the use of these means together that is wanted."

The means of treatment thus enumerated are described in detail and at some length in separate chapters. We shall endeavour to give a brief account of them, being impressed with their therapeutic value and importance.

Seclusion is evidently, in many cases, almost essential. When a patient, who is weak, thin-blooded, emotional, and to whom a state of delicate health has become a long and, so to speak, cherished habit, is separated from the moral and physical surroundings which have become part of her life, you have effected a great change, which will not only be beneficial in itself, but will greatly aid in the treatment which is to follow. As a rule, Dr M. suggests that in summer seclusion is less desirable than in winter, if the patient is strong enough to gain help from change of air.

Rest is regarded as equally important with seclusion—in some respects more essential. The question whether we shall ask a patient to walk or to take rest turns up every day "Most often we incline to insist on exercise, and are led to do so from a belief that women walk too little, and that to move about a good deal every day is good for everybody. *I think we are as often wrong as right.*" There are self-indulgent people who require to be roused from their tendency to indolence. If you find a woman who has a good colour and is well nourished, who is able always to do what it pleases her to do, and who is tired by what does not please her, order her out of bed and control her with firmness. But there are many cases such as those already described morally like the preceding, but physically indicating great and decided defects of nutrition, in which no sensible man would urge exertion as a means of cure. The time for that may come; but it must follow a prolonged season of entire rest, with the other means still to be considered. In short, patients belonging to the one class *must* walk; the others should not, until their state of nutrition has been bettered.

Every grade of rest may be recommended, from repose on a sofa for some hours daily to entire rest in bed; but Dr Mitchell, in carrying out his general plan of treatment, is in the habit of asking his patients to remain in bed from six weeks to two months. At first, and sometimes for four or five weeks, the patient is not permitted to sit up or to sew, or write, or read. The moral influence of absolute repose is found to be of use. Nervous and anæmic women often take to it in a kindly manner. "From a restless life of irregular hours, and probably endless drugging, from heartful sympathy and over-zealous care, the patient passes to an atmosphere of quiet, to order and control, to the system and care of a thorough nurse, to an absence of drugs, and to simple diet. The result is always at first, whatever it may be afterwards, a sense of relief, and a remarkable and often quite abrupt disappearance of many of the nervous symptoms with which we are all of us too sadly familiar."

Under the head of rest, the mode in which it does good is very intelligently considered in accordance with physiological principle. Our space forbids us from going into this subject, but the chapter will repay perusal.

The next chapter, as the author remarks, might have been labelled, "How to deprive rest of its evils." The two expedients by which he has learned to use prolonged rest without doing harm are *massage* and *electricity*. Massage (manipulation): we do not know the origin of the name, but the process is thus described:—"An hour is chosen midway between two meals, and the patient lying in bed, the manipulator starts at the feet, and gently but firmly pinches up the skin, rolling it lightly between his or her fingers, and going carefully over the whole foot; then the toes are bent and moved about in every direction, and next with the thumbs and fingers the little muscles of the foot are kneaded and pinched more largely, and the interosseous groups worked at with the finger tips between the bones. At last the whole tissues of the foot are seized with both hands and somewhat firmly rolled about. Next the ankles are dealt with in like fashion, all the crevices between the articulating bones being sought out and kneaded, while the joint is put in every possible position. The leg is next treated, first by surface-pinching, and then by deeper grasping of the areolar tissue, and last by industrious and deeper pinching of the larger muscular masses, which for this purpose are put in a position of the utmost relaxation."

A similar process is carried on in the hand, arm, and all the muscles of the body, back, loins, and abdomen. The principle of treatment must be kept in view, viz., to promote the healthy nutrition of the muscular system and to favour the flow of venous blood-currents. After the first few days, advantage is believed to accrue by keeping the part rubbed lubricated with cocoa oil or vaseline.

The daily *massage* is kept up for six weeks, and then, if things are proceeding favourably, half of the hour is spent in exercising the limbs as a preparation for walking; movements of flexion and extension being made which the patient is expected to resist. Some curious tabular information is given regarding the effects of manipulation on the temperature.

A chapter follows on *electricity* as another means made use of for the purpose of exercising muscles in persons at rest. In order to do this with the least amount of pain and annoyance, Dr Mitchell makes use of an induction current, with interruptions as slow as one in every two or five seconds. The poles, covered with well-wetted sponges, are placed on each muscle in turn, and kept about four inches apart. Of the four means, rest, seclusion, massage, and electricity, if one is to be left out, he has no hesitation in say-that it should be electricity.

The next chapter is entitled, *Dietetics and Therapeutics.*

In the case of anæmic patients, occasionally met with, after putting the patients at absolute rest in bed, he places them on a diet of skimmed milk, which will sometimes thin them at the rate of about half-a-pound daily. Two quarts of the skimmed milk daily, given at intervals of two hours, will usually sustain the weight. Beef-soup may be substituted for a day at a time, to obviate the disgust occasioned by the milk.

In the case of a person, thin-blooded, feeble and lacking flesh, having made sure that there is no grave uterine, renal, or pulmonary affection, we separate the woman from her friends, we put her at entire rest in bed, and then get her by degrees on a milk diet. We thus know with precision the amount of food taken. It dismisses as if by magic all symptoms of dyspepsia. It is a great aid towards getting rid of chloral, bromides, morphia, and stimulants.

In a few days a light breakfast is allowed; in a day or two more, a mutton-chop is given for dinner, and bread and butter twice or thrice a day. The milk allowance goes on. A wise remark is made at this point. "People who will eat very little if they feed themselves, often take a large amount when fed by another; and, as I have said before, nothing is more tiresome for a patient flat on her back to cut up her food, and to use the fork and spoon. By the plan of feeding we thus gain doubly."

So soon as the patient begins to take other food than milk, Dr Mitchell gives iron. He prefers the old subcarbonate of the U. S. Pharmacopia in pretty large doses. If the bowels are constipated, a pill, with quarter of a grain of watery extract of aloes and two grains of dried ox-gall may be given twice or thrice a day.

When the full dietetic treatment has been reached, and kept up for a few days, we must watch the urine carefully. If urates are precipitated, the amount of nitrogenous food should be lessened, until the urine is again free from sediment.

A number of very successful cases are given, showing, as we think very indisputably, that the plan recommended and so carefully expounded, has strong claims upon the attention of the profession. The volume we have reviewed is unpretentious, the result evidently of much careful clinical observation, and at the same time very apt to be overlooked in these days of rapid driving and hot haste. This is our reason for bestowing upon it more time and space than its size might seem to demand.

Clinical Lectures on Stricture of the Urethra and other Disorders of the Urinary Organs. By R. HARRISON, F.R.C.S. (Churchill).

In book-writing, as in more important matters, fashions change. There are conservative authors and liberal authors, leaders and followers of both classes. The issue of monographs is a thing of the past; compilations, except they present some novelty in design or arrangement, are not countenanced. The easy access to publicity afforded by our present weekly and monthly issues have snuffed out the good old quarterlies, while a dead weight is brought to bear on succinct treatises by fifteen-volumed encyclopædias.

The work before us pretends to be neither exhaustive of the subjects treated of, nor to serve as a book of reference. It expresses the author's views, and criticises some of those enunciated by other surgeons, "upon points of practice which are still open to discussion and consideration." Mr Harrison's style affords easy and pleasant reading, his opinions are based on practice and illustrated by cases, and he shows thorough conversance with the novelties from time to time proposed for the treatment of diseases of the urinary organs. Books of this class, and in equally good form, on single classes or groups of diseases, are much needed.

They are essential to the student, and they greatly assist the busy general practitioner.

In the first half of his lectures, nine in number, Mr Harrison treats of stricture, its nature, varieties, treatment, complications, etc., while the remaining nine lectures describe the accidents to which the urethra is exposed, as rupture and the insertion of foreign bodies, also certain diseases, as stone and tumours, which may implicate the urethra and bladder. One most important class of diseases, viz., the syphilitic, is barely noticed by our author, and lecture eight might, we think, be somewhat extended to include some pithy, instructive remarks on this affection, while too much space has been devoted to that bugbear of the hasty and inexperienced surgeon, urethral fever. Mr Gouley's experience (footnote, p. 56) is indeed the best comment, and contains the advice most to be urged on students:—"I prepare all cases—with the exception, of course, of urgent cases—for five or six days before they are placed under mechanical treatment, and consequently now have in my own practice but few cases of urethral fever to treat."

This work should assist greatly in bringing about uniformity in the treatment of at least some forms of stricture, and of other affections of the urinary organs. The material for study is derived not only from individual practice, but reference is made to similar cases published by other surgeons; while our author is to be envied for the especially good opportunities offered by a seaport town like Liverpool (unequalled in this respect by any other town) in such accidents as result from the "forcing" of stricture on board ship by means of the wire from a soda-water bottle, by an iron skewer, by a pointed piece of wood, etc. (p. 2), and in other accidents connected with a seafaring life. Our author's motto is "uniformity of practice is only to be obtained by taking the sum of our respective experiences," and he very wisely enjoins thorough anatomical knowledge on those desiring to practise surgery aright. His second lecture, therefore, is full of useful hints on how to pass a catheter based on anatomy:—"Now, I dare say many of you learnt to pass a catheter with tolerable dexterity before you knew anything from dissection of the anatomy of the parts operated upon; and so, perhaps, you might continue to do, but the occasion will come when you will find yourself entirely at a loss, and unable to give your patient that assistance which you might otherwise have done" (p. 13). "Fewer false passages would be made in difficult cases of catheterism if we bore in mind that we had the means of testing in the deep portion of the urethra the course the instrument was taking, and of rendering assistance to the passage of the instrument through the stricture by the introduction of the finger into the rectum" (p. 28). So also in the next chapter (Lect. III.) it is laid down as a maxim always to be followed, to use every means for determining the precise condition of the kidneys before deciding on the method of treatment to be pursued in any case of stricture. A further detail observed by our author in his practice, and one well deserving attention from all surgeons, is to note the temperature when treating a patient by continuous dilatation (p. 47).

Two novelties mentioned by Mr Harrison are the endoscope and the urethrametre. After extensive experience he pronounces in favour of Desornceaux's endoscope as modified by Dr Cruise of Dublin, but limits its application to certain cases of granular urethritis. He discusses Dr Otis's views very fully in Lectures II. and XI., although he does not agree entirely in the American surgeon's opinions.

Our author's remarks on external urethrotomy, subcutaneous urethrotomy, and internal urethrotomy, are especially noteworthy. Having practised the various methods recommended, he points out clearly the conditions which should guide the surgeon in his choice (Lectures VII. and XI.) His opinion, based on experience, is not empirical blindness, but a memory of results wisely directed by careful observation. The description of external urethrotomy, as practised by Mr Wheelhouse of Leeds (pp. 73–78), is well worthy of careful perusal.

To other excellent qualities Mr Harrison adds that of ingenuity, as shown in his urethrotome and in his pessary catheter. His urethrotome, depicted in p. 112, divides the urethra in a double manner, and he maintains both incisions patent by introducing from time to time after division oval-shaped bougies. Moreover, inasmuch as the urethra becomes naturally narrower towards its external orifice, our author diminishes the handles of these bougies gradually towards the orifice, so as not to stretch the meatus. His pessary catheter, shown in p. 147, is also an ingenious, and will probably prove a very useful, instrument. By its means medicaments can be applied directly to the interior of the bladder. "A grain of morphia introduced into the bladder in this way, and repeated twice in the twenty-four hours, has, in several instances, completely and permanently relieved the most distressing symptoms of irritation." This, indeed, seems a very important advance in the treatment of cystic affections. We cannot in a short review pick out all the useful suggestions given by Mr Harrison to his students, but we cull one more from p. 167:—"Do not retain the lithotrite too long in the bladder. If you cannot do all you want to do within three minutes, you had better leave it undone." The bladder, like the stomach, is a sensitive organ which readily repels mechanical or other irritants. This cannot be too strenuously borne in mind. Our author's last two lectures form an interesting record of eccentricities, as scirrhus of the prostate.

The book before us has been well got up, printed in good type, with few typographical errors, and is well illustrated. It includes also a valuable index. Altogether, we may congratulate Mr Harrison on presenting the profession with a very readable, useful, and practical book, succinct in style, without omitting important hints, treating of a class of diseases from which few mortals escape.

Transactions of the Obstetrical Society of London. Vol. XIX.

We have perused this volume with much pleasure, and can safely assure our readers that there is some good work in it. Several of the papers are specially interesting and valuable, while there is a praiseworthy absence of the marvellous and the rare, which so often in the *res gestæ* of scientific societies take up the time and space that ought to be bestowed on better work.

The address of the retiring President (Dr Priestley) is deserving of careful attention. It is written in a thoughtful and judicial spirit, and is particularly valuable, we think, for the conservative position it takes up in relation both to the use of forceps and to the treatment of extrauterine fœtation.

Dr Edis furnishes a paper on "The Forceps in Modern Midwifery," which is followed by a rather desultory and resultless discussion. We desiderate more point and clearness in the management of this difficult subject than is shown in either the paper or the discussion. We think that there is a manifest tendency to the too frequent employment of forceps at present, and on that account we were greatly pleased to see Dr Galabin recently raise his voice on the side of caution. Such accomplished operators as Dr George Johnston may deliver patients with safety when the cervix is only 1¾ inches in diameter; but we tremble to think of the consequences that may arise when such principles of practice are promulgated among the rash and inexperienced.

Besides, we are not prepared to accept mortality of either mother or child, or both, as a standard to measure the abuse of forceps. We can appeal to experience where much needless misery has been inflicted upon mother and child, although directly, at least, such would not appear in mortality records. The injuries we refer to are, to the mother, deep lacerations of the cervix, vagina, and perineum, and cranial injuries to the child, so frequently the result of forceps, and the cause of incalculable misery; and yet these seldom prove directly fatal. The more we know of midwifery, the more we feel assured that though the forceps, carefully used, and in appropriate cases, are harmless and most invaluable instruments, they are extremely liable to be abused. Besides this, the busy practitioner is very much tempted to use them too frequently.

We also miss in this paper all attempts at determining which varieties of pelvic contraction of low degree may be expected to give best results from the use of forceps. Pelvic deformity seems not to have attracted to itself that amount of attention in the London Obstetrical Society which its importance deserves. Indeed, there

seems to be too good reason for the rather severe remarks made on this head by Spiegelberg, in reference to English obstetricians.

Dr William Playfair is the author of an interesting paper on "Fibroid Tumour Complicating Delivery." Dr Braithwaite contributes a short paper, followed by a long discussion, on a "New Mode of Treating Retroflexion of the Unimpregnated Uterus." Had we not reason to know that Dr Braithwaite is a busy man, we should certainly have come to the conclusion that he had been victimized by a certain personage who, Dr Watts declares, pays special attention to idle hands.

We had fondly hoped the time had gone by when distinguished obstetricians would advocate intrauterine pessaries so strongly as many of the members of the Society did on this occasion. We ourselves have used them, and have had so much reason to regret ever having done so, that we are not likely to repeat the attempt. Moreover, we strongly believe it would be better for womankind if such pessaries were entirely given up.

In a valuable article upon "Membranous Dysmenorrhœa" Dr John Williams arrives at the following conclusions :—

1. The dysmenorrhœal membrane is not the product of conception, but the decidua ordinarily shed as debris with every menstrual epoch.
2. It is expelled as a whole or in masses in consequence of the presence of an excess of fibrous tissue in the wall of the uterus; this excess is due to imperfect evolution at puberty, imperfect involution after parturition or abortion, or it is the product of acute inflammation.
3. The membrane is neither the result of an ovarian congestion, nor of an hypertrophy of the ordinary decidua.
4. The chronic inflammation present is usually the result of the monthly expulsion of the decidua from the uterus, and plays an accidental part only in its production; the inflammation may, however, be independent of the expulsion of the membrane, but usually it has no causal relation to the formation of the latter.
5. Sterility is not necessarily associated with the affection, but is the result of the condition induced by the expulsion of the membrane from the uterus and ovaries.
6. The membrane may be expelled without pain.
7. Inflammation of the uterus greatly aggravates the suffering caused by the passage of the membrane along the cervical canal.
8. Great relief may be obtained by curing the inflammation of the cervix, though the membrane continues to be expelled every month.
9. In order to effect a cure the structure of the whole of the body of the uterus must be altered.

In several points it will be seen Dr Williams departs from the commonly accepted pathology of membranous dysmenorrhœa. The only special treatment he has to propose is prophylaxis against anything likely to disturb the uterine functions of young girls, and of grown-up women after parturition and miscarriage, and the use of galvanism—either the constant current, as employed by Solowieff, or the galvanic pessary. He also would endeavour to cure the cervical or endometritic disease, as by so doing he finds, from an analysis of his cases, that the pain accompanying the expulsion of the false membrane is greatly lessened.

The paper is original, thoughtful, and valuable, whatever amount of truth there may be ultimately found in the special view urged in the paper—that the formation of the membrane is the result of excess of fibrous tissues in the uterine wall. We cannot help thinking that a deeper cause has yet to be discovered for this troublesome affection.

Mr Spencer Wells records other seven cases of ovariotomy performed during pregnancy, making, with the two previously announced, nine in all of such operations. Of these nine operations only one was fatal to the mother, and in five the pregnancies were not interrupted. This certainly shows a marvellous success under extremely untoward circumstances.

In connexion with this subject, but by no means comparable with it in success, we may mention the four cases reported by Mr Lawson Tait, in which he removed large fibroid tumours along with more or less of the uterus by abdominal section. Of these two died and two lived. This operation in the hands of Keith has hitherto been very successful, and promises to be some day a recognized operation. But, considering the risks involved, and the fact that even severe fibroids are usually capable of considerable benefit from non-operative treatment, we think this operation ought to be restricted to cases directly threatening the life of the woman, and ought not to be made dependent on the whim of the patient herself, as in Mr Tait's third case. We hardly think that in a matter of this kind the wish of the patient, who can have no correct idea of the comparative risks involved, ought ever to weigh materially with the surgeon in determining his action.

We observe an interesting synopsis of 1500 obstetrical cases by Dr W. T. Greene. The maternal deaths in these 1500 cases were 12, which, considering the variety of causes that led to them, we think is surprisingly small. We therefore cannot agree with Dr Edis in his criticism that it is large, and still less can we accept the results of any institution where the patients are attended at their own homes, such as the Birmingham Charity, quoted by Dr Edis, as trustworthy. Without imputing any intentional attempt at deception, such institutions have far too lax a hold upon their patients to be able to afford statistics worthy of attention. For much valuable material on this important subject, we refer our readers to Duncan's work on *Mortality of Children and Maternity Hospitals.*

Dr Galabin contributes a very closely-reasoned paper on the "Choice of the Leg in Version," in which much ability is evinced in the application of exact mathematical demonstration to the solution of this subject. Dr Galabin advocates the performance of version in transverse cases, except on certain rare occasions, by the aid of the arm that is homonymous with the presenting shoulder, and gives his reasons for the choice.

We entirely agree with him both in the practical and theoretical part of the paper, and also think that it augurs well for the future of British midwifery, when its younger members are able to draw upon the exact sciences with such ease and advantage in the solution of its difficult problems. Obstetrics already owes much to the mathematical and physical sciences for the removal of many uncertainties within its range, and for the establishment of accurate methods of practice. An inquiry such as this one shows how these methods may be further profitably extended. It is only to be regretted that the education of the profession in general is hardly up to the point when it can fully appreciate the advantage of such procedure.

There are several other papers of importance, but our space will not allow us to refer to them. We may say, however, that we take leave of the volume with a feeling of pleasure and satisfaction.

Sanitary Houses: Two Lectures to Builders and Plumbers By J. A. RUSSELL, M.A., M.B., B.Sc. (Public Health). Pp. 56. Edinburgh: Maclachlan and Stewart: 1878.

THIS excellent pamphlet is a step in the right direction. The literature of popular sanitary science is extensive enough, and we wish we could add, sufficiently intelligible for the class of readers for which it is intended. But the practical working man has never as yet been directly addressed. The question as to the power of the negro to change his outward appearance still remains unanswered. We fear it will be almost equally difficult to answer the other query that is now in everybody's mouth, Is there such a being as an honest, *i.e.*, intelligent plumber. We doubt it, and shall continue to do so until we find these plain sensible lectures in the hands of the trade, and made the text of sound commentaries to journeymen and apprentices by masters and foremen. Dr Russell has been the first to break ground in this direction, and we thank him heartily for his first effort. The public are tired of being lectured to on such subjects, while the dangers to which they are exposed from the veriest ignorance of the simplest physical laws, and from the grossest carelessness on the part of tradesmen, are as imminent as ever. The important trades addressed by Dr Russell must submit to be addressed by scientific men, and must learn the rudiments of sanitary science. In self defence, our citizens are now forming vigilance committees to protect themselves from faults of construction in their dwellings and defective workmanship in their sanitary appliances. This is all very well, but the root of the evil is the ignorance of masters and men. Till this is remedied, we shall continue to suffer great discomfort, entailing expense, sickness, and death. For the first time the journeymen in these trades have been directly addressed, and it behoves them to profit by these lectures. We heartily indorse their teaching, and recommend the pamphlet to both lay and professional readers as an excellent epitome of our knowledge of the sanitary requirements of a healthy house. Dr Russell is a practical as well as a scientific sanitarian, and knows well how to illustrate great truths, and render them comprehensible to imperfectly cultivated minds. We trust to hear of him in some wider sphere of labour, where he can not only give expression to his views, but have the satisfaction of being able to carry them into beneficial operation.

Chorea and Whooping-Cough. Five Lectures by OCTAVIUS STURGES, M.D., Physician to the Westminster Hospital; Assistant Physician to the Hospital for Sick Children. London: 1877.

WE are not sure that this little book adds much that is satisfactory to the literature of these diseases. The former, we may say, without going into his somewhat elaborate argument, is referred by the author to mental impressions in sensitive natures at susceptible periods of life. The latter is divested of its peculiarities as a catarrhal affection, contagious, and accompanied by symptoms depending on the nervous centres, by denying its tendency to spread by contact, by calling in the principle of irritation, and by alleging that it is essentially a disease of infancy when there is a "morbid exaltation of sensibility of the bronchial mucous membrane."

Dr Sturges, moreover, has no faith in the efficacy of medicine, either in chorea or whooping-cough, believing that both diseases run their course little modified by anything that the physician can prescribe. On the subject of treatment, he says: "I have a belief, sufficiently strong to induce me to make trial of it on occasion, that *arsenic* sometimes changes the current of the disease (chorea), and hastens the time of improvement; yet even this measure of success has been so partial and equivocal that the statement of Dr Begbie, 'that he has never known *arsenic* fail in an experience of thirty years,' strikes me as amazing." We must say, that our own more limited experience is quite in accordance with that of our late eminent friend; and we hope that Dr Sturges, in his ample field of observation, will give the remedy a fair and unbiassed trial, before he finally condemns it. The following case will perhaps encourage him in doing so, and suggest that both of the diseases he describes have something in common as neurotic affections. A young gentleman, ten years old, had been affected for several weeks with a peculiar cough (resembling the hoarse deep bark of a large dog more than any other sound), which was frequent, very urgent, and exhausting. There was no expectoration. The voice was clear and natural. The chest free from signs of disease. He had a pale, feeble look, with a dark colour of the lower lids, which were also somewhat swollen. The pulse was small and languid. He had been sent from a neighbouring city, in the hope that change of air might be useful; but he rather got worse. Various remedies had been tried for counter-irritation—fomentation, nauseating expectorants, chloral hydrate, bromide of potassium—but with no good effect. Hearing that a sister at the same age had been affected with *Chorea*, the writer of this took the hint and prescribed as follows: Arsenici albi, gr. $\frac{1}{4}$; zinci phosphat, gr. xx.; conserv. ros. qu. s. *fiat massula. Divide in pil* xx. *Signa*—One pill to be taken four times a day.

After a few pills had been taken, a very decided improvement was observed, and it steadily advanced.

At the end of a week he returned to his home, the cough being now very rare and trifling. He looked well, took his food with appetite, and was full of activity and in high spirits.

In the *Appendix* to his lectures a case is related by Dr Sturges, as illustrative of what he designates, "the starting place of *chorea*." In this case, the affection followed a headache in a child of five years, and was strictly confined to the right side of the body. The poor child had been oppressed with lessons at school; the mother referring the illness, with probable correctness, to "too much study." It was evidently a case of cerebral lesion, not of functional derangement.

On the whole, we think that the author, after cultivating his field of observation in Great Ormond Street, will see occasion in a future edition to modify some of his opinions.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LVII.—MEETING VII.

Wednesday, 1st May 1878.—Professor SANDERS, *President, in the Chair.*

EXHIBITION OF PATIENTS.

I. *Dr G. W. Balfour* showed a CHILD aged 6 with well-marked UNILATERAL ATHETOSIS implicating both HAND AND FOOT. It had existed in the child for three years without any previous disease. The only causes discoverable seemed to be bad hygiene and bad food. The movements were absent during sleep, were increased by friction, and were apparently limited to the part below the elbow and knee. There were but few cases of athetosis on record, and still fewer in which, as in this child, there had been no previous history of epilepsy. So far as he knew there were only three previously-recorded cases of this character, two by Professor Gairdner and one in Virchow's *Archiv*. All the other cases had been associated with epilepsy, and it seemed probable that in this connexion athetosis was not so rare as at first sight it seemed. Many years ago he had recorded a case of epilepsy which had been thirteen years under his own care, and in which athetosis was a prominent symptom. As this occurred in 1862, and the case was published in 1868 before the word athetosis was coined, the symptom had not received any name. But in the *Edinburgh Medical Journal* for March 1868, p. 782, it is recorded—"He had always had occasional twitchings in his right hand, but now it began to twist, and this would continue for many hours, preventing sleep or rest;" and, from his own recollection of the case, he was aware that it was what would now be called a case of epilepsy complicated by athetosis. In this case, after trying various remedies, great relief was obtained from ten-minim doses of liquor ergotæ. As the case went on the fits became more frequent and severe, and the tonic spasms less easily controlled by the ergot, though still much modified by its use. At this time trephining was resorted to, the immediate result of the operation being the total cessation of the athetosis. For two years the patient remained nearly free of fits, and then died exhausted from a succession of severe fits accompanied by marked athetosis. On dissection, the trephine was found to have been applied rather posterior to the centre of the left parietal bone. Directly beneath this opening, about one inch anterior to the parieto-occipital fissure, there was an opening in the centre of one of the cerebral convolutions leading to a cavity the size of a small walnut, containing yellowish serum and crystals of hæmatoidine. The case now exhibited had been much benefited by the use of ergot, and from the case just referred to it would seem as if trephining might be resorted to with a fair prospect of success in very severe cases. He looked upon the symptoms as in all probability due to a limited and localized congestion.

II. *Dr Andrew* showed—(1.) a SPLEEN weighing 13½ ounces, removed from a child æt. 18 months. The child was rachitic and very anæmic, during life a large tumour was felt in the left side of the abdomen, and the white blood-corpuscles were found on microscopic examination to be greatly increased in number. An interesting point was that the grandfather of the child had died of liver and spleen disease, a brother æt. 18 had died of smallpox with an enlarged spleen, and two other brothers, one 13 months and the other 7 months, had died of anæmia, both also having greatly enlarged spleens. With the exception of the grandfather, who was a half-caste, none of the family had ever been in a malarious district. (2.) The BRAIN of a boy æt. 5, with a tubercular tumour the size of a walnut in the cerebellum, and a smaller one on the surface of the brain. The history of the case was as follows:—John T., æt. 5, admitted into the Sick Children's Hospital 18th February. Complains of pain in the head, drowsiness, and inability to stand or walk. Previous health had always been good, and he had been remarkable for his high spirits and intelligence. Family history—both parents and a brother and sister alive and healthy; none dead; no history of phthisis, scrofula, or syphilis. About a month before admission to the hospital, he began to show signs of general malaise, and to complain of a pain in his head. His sight soon became affected, he began to make odd remarks, and later on he lost the power in his legs. On admission he was found to be unable to stand, and both legs displayed a certain degree of anæsthesia. He had no control over the sphincters of the bladder and rectum, both urine and fæces being passed in bed. He was able to chew and swallow, and could use his hands. At this time there were no involuntary movements of the muscles. His intelligence was much perverted, he answered questions readily, but not unfrequently the answers were absurd and even comical. On being asked if he had any pain, he invariably said he had "in the front;" and, on being asked to show the place, almost always put his hand with a tremulous motion over the vertex. Raising him in bed seemed to increase the pain, and the expression of his face, before peaceful, at once became distorted and indicative of suffering. He did not sleep well, but spent most of the night soliloquizing. The special senses except sight seemed normal. On examining the eyes the pupils were found dilated, and did not contract even on exposure to a very strong light, and he was evidently quite blind. Heart and lungs normal. Urine normal. No improvement took place, but he gradually became weaker, his pulse becoming more feeble and irregular. A fortnight after admission his eyes were examined by Dr Argyll Robertson, who pronounced him to have double optic neuritis. About the beginning of April his forearm became flexed on the arm, and the fingers clenched by tonic contraction of the muscles; this condition became more marked, and by the middle of the month his arms could not be moved without great difficulty. For the last few days of his life he became very much quieter, his appetite failed, and he could scarcely be induced to take anything but wine or brandy. Death took place on the 27th April.

I am indebted to the Resident, Dr W. R. Gibson, for notes of this case.

III. *Dr Bramwell*, Newcastle-on-Tyne, showed—(1.) a HEART, with an aneurism about the size of a greengage plum in the cavity of the left auricle—the acute cardiac aneurism of Rokitansky. (2.) A CYSTIC TUMOUR in the anterior mediastinum. It contained a clear liquid, highly albuminous, with low sp. gr. and no solid matter. (3.) A specimen of aneurism of the aorta, innominate right common carotid, left common carotid, and left subclavian arteries, illustrative of the differential diagnosis between AORTIC ANEURISM AND SOLID INTRO-THORACIC TUMOURS. The notes of these interesting cases are given in full at page 1072 of this Journal for June 1878.

DISCUSSION ON DR ANGUS MACDONALD'S PAPER.

Professor Grainger Stewart had thought it a pity at their last meeting that such a valuable paper should be discussed in the short time then available; and accordingly at his suggestion the Society had agreed to defer it till their present meeting. The paper deserved their careful consideration both on account of the facts observed in the cases, and the hypothesis brought forward as possibly explaining these facts. He wished to make a few remarks on one or two points. In the first place, the lesion of the kidney was one which had not hitherto been described, at all events as an acute process. According to Mr Hamilton's report, the kidneys were of ordinary size; the capsule stripped off easily; they presented the naked-eye characters of ordinary acute inflammatory Bright's disease or parenchymatous nephritis as it is often called. Microscopically, however, the tubules were found blocked with what was described as colloid matter, and the tubules above the blockings were dilated, but lined with healthy epithelium. The colloid material was evidently derived from the epithelial cells, as some of which were seen to be swollen with it, while others had the colloid material issuing from them. The presence of the so-called colloid material in cysts of the kidney, and in cirrhotic kidney, with or without inflammation of tubules added, was familiar enough to them, and a material which might turn out to be colloid, was frequently present in certain stages of the waxy or amyloid disease; but as a product of an acute lesion it was, as he had already said, hitherto undescribed. The clinical features of the case were diminution of the amount of urine, its being of a dark colour, containing a large amount of albumen and numerous granular tube-casts, *i.e.*, the same urinary symptoms as are found in an ordinary inflammatory lesion of the kidney; but yet in this case while albumen and granular casts were numerous, it turned out that there was no change in the epithelium discoverable after death, except the presence of the colloid material. Clinically as well as pathologically, then, the case was interesting. It was worthy of notice that there exists another rare lesion of the kidney, viz., acute atrophy, which is attended with similar symptoms. Ten or twelve years ago, he had brought under the notice of the Society two cases in women recently confined, where with diminution of urine, albuminuria, and copious discharge of tube-casts, cerebral symptoms occurred. Lesions of the kidney, identical with those in acute atrophy of the liver, were found. One could trace the stages of infiltration of the cells, of fatty degeneration and breaking-down or disintegration. Many of the tubules were empty, and many filled with fattily degenerated or with swollen epithelium. Thus the clinical features were analogous in three or four distinct lesions, viz., acute atrophy, ordinary parenchymatous inflammation, glomerular nephritis, and the colloid lesion described by Hamilton and the author of the paper. The relation, however, between the kidney lesion and the head symptoms in Dr Macdonald's case was not clear to him. It might be held that the renal changes were secondary to nervous, but on the whole it was much more probable that the kidneys were first affected.

The second point about which he wished to say a few words, was the state of the nerve centres. He would first say that it was one of the most completely examined cases that had yet been published. He hoped it would be the first of a long series of such, which might be brought before the Society. The complete and accurate investigation had laid the members under deep obligations to the author of the paper. Of special interest was the central anæmia unattended by œdema, which, according to Traube and Rosentein, is the cause of the emptiness of the vessels. Of still greater interest were the changes in the medulla oblongata, viz., the presence of leucocytes around and passing through the vessels. These latter observations struck him as interesting in connexion with some clinical facts which are not unfrequently witnessed in cases of Bright's disease, where the symptoms were at first suggestive of a bulbar lesion, the articulation becoming thick and slow before any other uræmic symptom occurred. He had a specimen in process of hardening, which he hoped might throw some light on this. A patient suffering from cirrhosis of the kidneys had first manifested the uræmic tendency by restlessness and thickness of speech like that of a person in a state of alcoholic intoxication. That patient had died without any convulsion, and Dr Stewart thought it reasonable to expect to find some changes in, or in the neighbourhood of, the medulla oblongata. One good result flowing from the paper would be, that observers would be led to examine minutely that portion of the nervous system, and that probably important changes would be discovered, perhaps corresponding to those which Dr Macdonald had described.

The third point which he deemed worthy of special remark, was the hypothesis which Dr Macdonald had advanced in explanation of the phenomena, viz., that irritation of the vaso-motor centre was the cause of the anæmia of the brain and the consequent convulsions. But upon the discussion of this point he would not himself enter.

So many theories of uræmic convulsions had been advanced and rejected within the past thirty years, that he felt disinclined to enter upon a discussion of this one, which he understood Dr Macdonald had only thrown out as a suggestion. It might turn out correct, but of course being founded upon only a single case, he thought it of less importance than the very remarkable observations which preceded it. It would, at all events, prove useful by dividing the attention of others to the minute investigation of the state of the medulla oblongata in other examples of the disease. He begged to thank Dr Macdonald for the excellent work embodied in this paper.

Dr C. E. Underhill had shared in the interest of the Society. The whole case had been so well put, and the views argued so closely, that care was required to follow it. As he understood it, the convulsions were caused by the anæmia of the brain centres, the anæmia by over-stimulation of the vaso-motor centre, and this again by the poisoned blood. The account of the kidney-lesion was of great value, because they had often attacks coming on and disappearing quite unlike the history of parenchymatous disease. He had always thought that too much importance was attached to the presence or absence of albumen, and other points ignored. Of greater importance was any diminution in the amount of urine and urea excreted. The vaso-motor theory as explaining the anæmia of the brain was of very great value. At the same time, he thought Dr Macdonald was on doubtful ground as to the locality of the vaso-motor centre in man, seeing that we only knew the exact site in the lower animals, and they were not justified in arguing from them to man. The full record of the brain and kidney lesion was of importance; and though Dr Macdonald had built up a considerable superstructure on one case, still cases were, and post-mortems of them, still rarer.

Dr G. W. Balfour, in common with the other members, felt indebted to Mr Hamilton and Dr Macdonald for the very careful manner in which the history of the case and its morbid anatomy had been recorded. In regard to the pathogeny propounded, however, it was important to remember that there were numerous cases of chronic Bright, in which the patient lived for many years on the very brink of uræmia. In such cases the blood, almost saturated with the product of retrograde metamorphosis, poured off some of this morbid matter through the kidneys, at one end of the vascular connexion, taking in an equivalent amount from the tissues at the other, life being thus maintained for many years in a state of chronic blood-poisoning. In the face of this well-known fact it was difficult to understand how such intense cerebral anæmia, as described in this case, could be due to irritation of the vaso-motor centres by the blood-poisoning alone. He recognized the importance of the theory suggested, but considered that the fact he had mentioned was a rock ahead in the way of any such explanations which it would be very difficult to get rid of.

Dr Wyllie agreed with all as to the value of the paper. At the same time the subject was a difficult one, and some points admitted of discussion. The symptoms during life and the appearances in the brain after death were, he thought, not entirely such as to support the conclusions of Dr Macdonald, namely, that the fits were due to anæmia of the brain, and that this was produced by irritation of the vaso-motor centre and consequent spasm of the vessels. One would suppose that where there was great irritation of the vaso-motor centre, it would be evidenced during life by dilatation of the pupil, the sympathetic system being the source of nervous supply for the radiating fibres of the iris. In Dr Macdonald's report, however, it is stated that the pupils were somewhat contracted. Then in the brain after death there were two appearances which seemed more likely to be the results of congestion than of anæmia, viz., the extravasation of blood in the right corpus striatum, and the accumulation of migrated leucocytes in the medulla oblongata. In regard to the extravasation, Dr Macdonald suggested as a cause the weakening of the vascular walls by long-continued spasm and consequent malnutrition from want of blood. But even if so enfeebled, a vessel would rupture only after becoming dilated, and yet the vessels in the neighbourhood of the extravasation were found contracted and empty; so also with regard to the accumulation of migrated leucocytes in the medulla, the vessels in its neighbourhood were found empty, although all observation of acute inflammation showed congestion to be the invariable accompaniment of such migrations. It seemed, therefore, probable that congestion of the brain existed during the fits, and that the anæmia found after death was established at some time in the interval of fifteen hours that elapsed between the last convulsion and the death of the patient. He was personally interested in Mr Hamilton's observations on the kidneys. They were of special value, and he agreed with Professor Stewart as to their importance.

Mr D. J. Hamilton, as his name had been associated with the case, wished to say a few words in regard to it. The lesion of the kidney was one he had never seen in an acute case. Colloid degeneration occurred in the thyroid body, in adenoid tumours of the ovary, and in occluded uriniferous tubules. Until this case he had never seen colloid material produced in the kidney without obstruction; and as no obstruction was present, he could not see why it occurred. There could be no doubt that it was colloid similar to that in the waxy and contracted kidneys. Its action with reagents, its homogeneous appearance, and the accurate cast it took of the tubules, led him to say without hesitation that it was this substance. In regard to the convulsions, we had to make out whether the kidney lesion was primary or secondary. The kidney lesion was probably initial, but it was quite possible that the reverse might be the case, viz., that the subacute inflammation of the medulla oblongata was causal. An interesting experiment on the rabbit should be kept in mind. The kidney can be exposed and turned out of the abdomen by a vertical incision in the loin. By a median incision in the neck, the posterior aspect of the medulla oblongata and fourth ventricle can also be exposed. If then the vaso-motor centre be stimulated, the kidney gradually becomes anæmic. Thus it could be conclusively proved that anæmia of the kidney might arise from stimulation of the vaso-motor centre. The question now was, Did the colloid degeneration arise from this? It is quite possible that it did. Then as to the anæmia, it was certainly the most remarkable he had ever seen, the brain being literally blanched. In five chronic, idiopathic, epileptic patients, he had found on post-mortem examination a remarkable induration, almost cartilaginous, of the *corpora olivaria* and *medulla oblongata* between them. This was often found in epileptics, without any apparent lesion source elsewhere. He had not yet published these observations. Schroeder van der Kolk refers to it, but gives no explanation of its cause. The source of the induration in the above cases was evident on microscopic examination. In all he found marked cirrhosis like that in the liver, originating round the bloodvessels. These facts had a direct bearing on Dr Macdonald's theory of the cause of the convulsions in the case under consideration. He thought Dr Macdonald's explanation was supported both by pathological and physiological evidence. It seemed to him that Dr Wyllie's remarks about the hæmorrhages being probably the result of congestion really added support to the theory. Thus, in epilepsy there is apparently at first a spasm of the vessels causing anæmia and subsequently convulsions. Kussmaul and Tenner have shown that if anæmia be produced in the cerebral centres by ligature of the large arteries, convulsions are produced. In epilepsy, however, a stage of congestion apparently follows, characterized by the flushing and lividity of the face. In the medulla oblongata the vaso-motor areas lie between the calamus scriptorius and corpora quadrigemina. There is, however, every reason to believe that, in this same region, there is also a vaso-inhibitory centre. Judging from Rutherford's well-known analogous experiment in the rabbit, it is probable that this centre is peculiarly susceptible to the action of carbonic acid. During the spasm of the vessels in the first stage of an epileptic attack, the carbonic acid would naturally tend to accumulate in the system from averted circulation, producing an irritation of the vaso-inhibitory centre, and a subsequent dilatation of the cerebral bloodvessels. It is also probable that the exhaustion of the vaso-motor centres from the primary anæmia would also tend to bring about this result. The congestion which takes place in the second stage of an epileptic seizure is, judging from the appearance of external parts, very great, and it was probably at this period of the attack that the punctiform hæmorrhages occurred.

Mr Benjamin Bell had not been in the habit of attending the meetings for some years back, owing to advancing years and laziness. He had been struck on reading Dr Macdonald's able and suggestive paper, and had come to hear the discussion on it. Forty years ago Sir Astley Cooper had performed a series of experiments on the effects of ligature of both carotids and vertebrals. He (Mr Bell) further wished to know if there had been any accurate observations on cases of strychnia poisoning or other cases of toxæmia. As to the explanation Mr Hamilton had given of the congestion in epilepsy, he thought it was more probably due to embarrassment of respiration. He had read Dr Macdonald's paper with great pleasure, and had come to add his tribute of respect to the author.

Professor Simpson had felt considerable disappointment that Dr Macdonald had not been rewarded for bringing his paper before the Medico-Chirurgical Society by a discussion which threw any clearer light on the pathology of puerperal eclampsia. The subject was an intensely interesting one, as well as of great practical importance. Most of the members had been brought up in the belief that the convulsions were due to a poisoning of the blood. Two years ago, however, Dr Macdonald, in the communication to the Obstetrical Society to which he had referred, but which none of the special members of this Society seemed to have paid him the compliment of studying, had found three good reasons for disposing of the toxæmic theory; and Traube-Rosenstein's was accordingly aired as the true one. He himself was sorry to see a favourite theory shelved, and had entered a caveat against its summary dismissal; and he was rather amused to note, that now, after so short a time, the toxæmic theory was taken off the shelf, and the mechanical theory of 1876 laid aside, for Dr Macdonald in his present paper regarded toxæmia as the initial factor in his theory of the convulsions. He had come to the meeting expecting to hear the physicians and pathologists discuss the causes of puerperal convulsions in the light of all the more recent experiments and investigations bearing on the convulsions of epilepsy and anæmia, for many experiments such as Mr Bell had inquired about had been made with different varieties of poison. But as those who had been specially challenged to debate the question had very much given it the go-by, he would only point out that Rosenstein, as the result of his observations, had stated formally that if the poisoned blood produced convulsions, it must be by irritation of the vaso-motor centre. Now this was precisely the hypothesis that Dr Macdonald had advanced, but only on the ground of the observation made by Mr Hamilton in one single case. A second case, indeed, was related, but, as far as the history was given, it did not in the least bear out the theory that there was inflammatory irritation of the olivary bodies. Dr Macdonald, as to this case, had himself said, "My observations in the sequel of this paper in reference to the sections above described must be regarded as based almost exclusively upon the facts observed in the former of the two cases . . . . . The second case can only be looked upon as, on the whole, so far as the brain changes were developed, corroborative of the facts observed so pronouncedly in the first, and nothing more."[1] Then, as if in further support of his theory, Dr Macdonald had quoted a case of puerperal tetanus, recorded in the last volume of their *Obstetrical Transactions*. In this case, however, when it was related to the Obstetrical Society, the proximate cause of the tetanus was said to be venous obstruction,[2] and Dr Matthews Duncan, in the discussion that followed, said, "The great merit of the paper was in showing it to be really a case of puerperal tetanus. There could be no doubt that it was tetanic and not eclamptic."[3]

One comfort remained amid all this contradiction for the practitioners in that department of medicine—the advance which, according to Dr Macdonald, had been distigured and retarded by "rash generalizations and crude views." When he advocated in the Obstetrical Society the adoption of Rosenstein's mechanical theory, Dr Macdonald pointed out how beautifully it fitted in with the best approved practice in the treatment of puerperal convulsions—the employment, viz., of bloodletting, and the administration of chloral. And now it was partly on the harmony between the modes of action of these same remedies that he asked them here to adopt a modification of the toxæmic theory. So that when the obstetrician went to treat cases of puerperal convulsions, it did not matter what theory of their pathogeny he adopted, whether it was the mechanical theory or the theory of vaso-motor irritation by poisoned blood; chloral and bloodletting would give their happy results equally well explained by the one as by the other hypothesis.

Dr Macdonald, in reply, had no intention of delaying the Society with many remarks. He had taken a few notes of some of the criticisms, but Mr Hamilton had already answered these effectively. In regard to Dr Underhill's remarks on the locality of the vasomotor centre, he had taken the facts about it from Ferrier and Michael Foster, and as they suited his theory had used them. Dr G. W. Balfour's question was difficult to answer; but Dr Underhill's remarks about the amount of urine passed seemed important. In regard to Professor Simpson's remarks about his change of views, he hoped he would never take up a stereotype position. In the matter of puerperal eclampsia he was groping his way. He, indeed, never professed anything else. Sometimes he made a hit, sometimes a miss, but he was never ashamed to change his mind. In regard to the case of puerperal tetanus, he believed that, if seen at an earlier period, it would have been one of puerperal eclampsia. After the destruction of the corpora striata

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[1] *Edinburgh Medical Journal*, May 1878.

[2] *Edinburgh Obstetrical Transactions*, vol. iv. p. 108.

[3] *Ibid.*, p. 115.

by blood extravasation, there still remained the corpora quadrigemina, by whose irritation the tetanus was brought about. He wished, finally, to thank the members for the kind manner with which they had listened, and for their gentle and kind criticisms.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXVII.—MEETING IX.

Wednesday, 10th April 1878.—Dr Wilson, *President, in the Chair.*

Alexander Baird, M.B., C.M., Perth, was admitted an Ordinary Fellow.

I. *Professor Simpson* showed a POLY-COTYLEDONARY PLACENTA, in which the vessels exhibited a remarkable tortuosity and tendency to run over one another. This condition of twisting was no doubt produced under similar conditions in the placenta as in other parts, such as the uterus and ovaries, and of which we had the most familiar and most striking illustration in the normal torsion of the umbilical cord, which was wrongly considered by many to be due to purely mechanical causes.

II. *Professor Walley*, of the Dick Veterinary College, exhibited a preparation of (1.) TORSION OF THE CERVIX UTERI AND VAGINA OF A COW, and detailed particulars of the case. (See p. 1081 of this Journal for June 1878.) (2.) AN INTERRUPTED AND DIFFUSE ANEURISM OF THE SPERMATIC ARTERY OF A BULL. (See p. 1083 of this Journal for June 1878.)

III. *Mr Donovan* of Whitwick communicated the following NOTE OF A CASE OF SUPER-FŒTATION:—In January last I was sent for to attend Mrs S., a multipara, who stated she was six months pregnant, and had miscarried at about that period on several occasions. On making an examination, I found a bag of water protruding, which, on being ruptured, was found to contain a fœtus at about the third month. After waiting for some time, and no change taking place, I passed my hand up along the cord, and found the placenta adherent and attached fast within the os. Having removed it, and finding the uterus as large as ever and making no attempt at contraction, I introduced my hand, and found that the greater part of the uterine cavity was shut off from zonal portion by a strong membrane attached to the uterine wall all round, a short distance above the zone. Placing my left hand on the abdomen, a second fœtus could be felt occupying the upper and larger portion of the uterus. I ruptured the membranes, got hold of the feet, and delivered a living female child at about the sixth month, which survived its birth about fifteen minutes. My reasons for classing this as a true case of super-fœtation are,—the position occupied by the first-born fœtus being almost extra-uterine, lying as it did barely within the os, and having no connexion with any portion of the uterine cavity occupied by the other fœtus, being shut off by the intervening membrane. The different stages of development showed that a long period must have elapsed between the two conceptions.

Professor Simpson, Dr Angus Macdonald, and others of the Fellows, thought that Mr Donovan had not proved the case to be one of super-fœtation, but that it was more likely one of blighted twin pregnancy.

IV. *Professor Simpson* read NOTES OF A CASE OF SIMPLE KNOT ON THE FUNIS, which appears at p. 1080 of this Journal for June 1878.

Dr Wilson, while thanking Professor Simpson for his communication, stated his belief that such knots were often produced long before labour began.

Dr Underhill mentioned a case of twins that had come under his observation, in which the placenta was adherent and the cords elaborately knotted together.

V. *Professor Simpson* read a communication on FIBROMA VAGINÆ, which appears at p. 1078 of this Journal for June 1878. After a few remarks from Dr Underhill, public business was concluded.

Part Fourth.

PERISCOPE.

MONTHLY RETROSPECT OF OBSTETRICS AND GYNÆCOLOGY.

By Angus Macdonald, M.D.

In a paper of considerable merit on the mechanism of natural and artificial labour in narrow pelves, Dr Goodell of Pennsylvania formulates the following practical conclusions as an embodiment of the views held by him on the subject:—

I. "The unaided first-coming head and the aided after-coming head observe in a flat pelvis precisely the same laws of engagement and of descent. Hence version here means art *plus* nature.

II. The forceps, however applied in a flat pelvis, antagonizes more or less with the natural mechanism of labour. Hence the forceps here means art *versus* nature.

III. The aided and unaided first-coming head observe in a uniformly narrowed pelvis precisely the same laws of engagement and of descent. But version violates these laws. Hence the forceps here means art *plus* nature. At or above the brim of a flat pelvis, the fronto-mastoid, or even the fronto-occiput, application of the forceps interferes less with the moulding of the head, and violates less the natural mechanism of labour, than the bi-parietal application.

IV. In the flat pelvis, the vectis aids the natural mechanism of labour, and therefore meets the indications better than the forceps." —*Extracted from the Transactions of the International Medical Congress, and published at Philadelphia*, 1877.

THE NATURAL ORIGIN AND PREVENTION OF PUERPERAL FEVER. —In a thoughtful and learned paper upon this subject, communicated originally also to the International Medical Congress of 1876, Professor W. J. Lusk of New York gives a brief, and at the same time comprehensive, view of the present state of our knowledge on this subject. The reasonings are supported by some very valuable statistical tables.

Dr Lusk regards puerperal fever as non-specific, and divides it into a non-infectious and infectious form. By the former, he appears to mean simple wound fever, along with some regular febrile conditions determined by the puerperal state; by the latter, septicæmia.

The blood-poisoning in puerperal fever he regards as most probably bacterial in origin.

Some facts of a very valuable kind result from his examination into the statistics of New York City. The following we recommend to those of our readers who look upon maternity hospitals as necessarily hotbeds of infection:—

"The nurses in hospitals and in private practice are usually the carriers of contagion. In studying the records of New York City for nine years, I find, however, that the occurrence of two deaths from puerperal disease, following one another so closely as to lead to the suspicion of inoculation, occurred to thirty physicians. A sequence of these cases occurred in the practice of three physicians; one physician lost three cases, and afterwards two in succession; one physician had once two deaths, once three deaths, and twice four deaths following one another; finally, a physician reported once a loss of two cases near together, then of six patients in six months, and then of six patients in six weeks. Thus, in the practice of more than 1200 physicians in nine years, excluding cases occurring in hospitals, I find that the experience of thirty-six only lends colour to the idea that puerperal fever is due to criminal neglect on the part of the medical profession. Undoubtedly in many of these cases, too, the responsibility is only apparent, as when a practitioner has, for example, had the misfortune to lose in one week a woman from puerperal convulsions, and another in the following week from puerperal hæmorrhage. Singularly enough, not one of the sequences mentioned occurred in the practice of a physician connected with a lying-in hospital. In face of the charge that the physicians holding obstetrical appointments in public institutions are active disseminators of puerperal fever through populous communities, I find that the total loss from all puerperal causes occurring in the private practice of ten physicians intimately associated with such institutions, numbered, during the nine years, but twenty-one cases. Of these, thirteen were the result of ordinary accidents, and only eight cases of metria proper, of which one was developed before the physician was called in attendance; whereas a single physician, holding no hospital appointment, lost during the same time twenty-seven cases, of which twenty-one were cases of metria."

The above statistics speak for themselves.

The following are the conclusions arrived at by Dr Lusk in his paper:—

I. There is no specific puerperal fever, and as long as when the term is limited, each physician uses it in some sense personal to himself, it is best to employ it as a general term for all the febrile affections peculiar to the puerperal state.

II. Puerperal fever, the term being used as above, may be either a non-infectious or an infectious disease.

III. The non-infectious form is due to traumatic inflammations of a simple character—to old peritoneal adhesions, to moral causes, and to the vulnerability of the patient.

IV. The infectious form, on the other hand, is a septic disease, intimately associated with the existence in the tissues of minute organisms, which form the connecting link between puerperal fever and erysipelas and diphtheria.

V. Its causes are certain atmospheric conditions (nosocomial malaria of hospitals) and infection from septic maternity. It prevails most in certain winter months, and finds its victims chiefly among the very poor.

VI. Prevention is best accomplished in hospitals by the adoption of Lister's principles. Maternity hospitals are no longer necessarily foci of disease. Small maternities, if well managed, meet a need among the very poor, and their establishment by the charitable should be encouraged. In private practice, the physician should never, and need never, be the carrier of contagion. The antecedents of nurses should be investigated. Auto-infection should be very rare in cases properly managed during the period of labour.

VII. The question of personal responsibility cannot be too strongly impressed upon the medical profession.

THE PROPHYLACTIC TREATMENT OF PLACENTA PRÆVIA.—Dr T. Gaillard Thomas communicates a thoughtful paper on this subject to the *American Practitioner* of May 1877, in which he powerfully urges the propriety of early interference in all cases of severe hæmorrhage arising from placenta prævia by dilatation of the cervix and version.

These views are supported by short records of eleven cases.

IS THERE NOT AN ELEMENT WANTING IN THE CONSTRUCTION OF THE OBSTETRIC FORCEPS? This is the starting-point of a paper of considerable length by Dr J. A. M'Ferran in the *Philadelphia Medical and Surgical Reporter* of 8th December 1877.

The defect which the author finds in the forceps is a want of adaptability to the axis of the brim of a deformed pelvis, with an abnormally advanced sacral promontory, in which the axis of the inlet is thrown so far backwards that it is impossible to exert traction in it with the ordinary instrument when the head is at the brim. To remedy this defect, the author proposes to have the blades connected with the shanks by means of hinges, allowing them to move from side to side, and which would allow the head in the grasp of the blade to move freely in correspondence with the axis of the pelvis, however much the latter was directed from above downwards and backwards. These forceps are provided with a catch that renders each blade a rigid bar till they are locked and secured, after which the catch is removed, and the motion of the head in the grasp of the blades round an ante-posterior axis passing through the occipito-athoid articulation of the child is permitted. Traction in the pelvic axis is to be then made in such cases by using the handles of the forceps as a lever of the third order, the left hand of the operator acting as a fulcrum at the outer extremity of the handles, the right hand being employed as the power to drag the head downwards and backwards in the axis of the pelvis, whilst the resistance of the advance of the head acting through the hinges of the forceps is the weight. It is difficult to judge of the value of such an instrument without seeing and trying it. But we feel hardly inclined to admit that the ordinary forceps cannot be so used as to exert traction in the axis of any pelvis for which the operation is applicable. Again, it seems to us impossible, according to the method of traction proposed by the author, to exert in a difficult case the necessary amount of traction. The necessity, also, of permanently fixing the head in this forceps, is to our mind a very serious objection to this forceps, as well as to the more complicated instrument invented by Professor Tarnier for the same purpose.

FOUR SUCCESSIVE RUPTURES OF THE UTERUS IN THE SAME PATIENT, WITH FAVOURABLE TERMINATION.—An extraordinary paper with the above heading was published in the *Chicago Medical Journal* of August 1877, by Dr Rose of West Winfield, N.Y. It gives a circumstantial account of the occurrence of a rent in the same patient's uterus in four successive labours, so large as to admit of the escape of the child completely into the peritoneal cavity each time. Dr Rose drew back the child through the rent feet foremost without apparently any trouble, and on one occasion took the opportunity to explore the condition of the entire abdominal organs, and, *mirabile dictu,* though this was after the third occurrence of rupture, no abnormal adhesions had taken place between the various organs. There was never any prolapse of intestines, and the patient recovered admirably each time. There is no attempt to explain why the rupture took place, which is said to have occurred in the posterior wall, nor is there any attempt to localize the site of the rent more particularly. There seems, from the ease with which turning was effected and delivery completed, to have been no pelvic deformity. None is mentioned.

The reporter of this paper, in the *Centralblatt für Gynäkologie*, No. 17, 1877, takes care to guard himself against the suspicion of believing the story.

Dr Paul F. Munde of New York, with a praiseworthy desire to take the edge off this sceptical expression, in a communication to the *Centralblatt*, No. 7, 1878, states that he has satisfied himself, by strict inquiry from Dr Byford of Chicago, Dr Rose himself, and others, the statements were every one of them true; and further, that Dr Rose's diagnostic ability was such as permitted no doubt to be entertained. He adds, moreover, that however rare, indeed unique, the case may be, it appears scarcely right, in the face of this *for him* completely sufficient proof, to harbour any further doubts respecting the case. He concludes by expressing the hope that after this statement the editors and reporter of the *Centralblatt* will agree with him. These gentlemen, however, maintain a significant silence on the matter. It seems to us that, if they were to reply, it would be in something like the terms in which a friend of ours, of classic taste, expressed himself on hearing the story, viz., "*Credat Judæus non ego.*" We have no wish to throw unjustifiable doubt upon the relation of any fact, however strange, that is supported with a sufficiency of evidence. But the report of the successive accidents are far too loosely given to warrant us in believing so extremely incredible and impossible-looking series of circumstances. Without imputing intentional deceit to Dr Rose, it does appear to us that it is far more likely that Dr Rose, notwithstanding his forty years' experience, should have been mistaken as to the matter of fact, than that such a series of extraordinary occurrences should have happened.

AMPUTATION OF THE CERVIX UTERI.—This is the subject of an interesting article in the January number for this year of the *Annales de Gynécologie*, by Dr A. Leblond. After a statement of the history of the operation, its risks, and the anatomy of the parts concerned, Dr Leblond describes at length the various methods that have been proposed, gives the indications that suit best with each method, and comes to the following conclusions:—*1st*, That the amputation of the cervix ought to be practised with the uterus in its natural position; *2d*, That the galvano-caustic method is particularly applicable to uterine cancer, although it may be equally employed in simple hypertrophy; *3d*, That, in default of galvano-caustic, it is the écraseur we ought especially to choose in the case of cancer; *4th*, That the scissors are preferable to the bistoury where one does not care to employ the galvano-caustic or the écraseur; *5th*, That the bistoury ought not to be employed, except in the elongation of the supra-vaginal portion of the cervix.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By WILLIAM CRAIG, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

EFFECTS OF CARBOLIC ACID ON THE URINE.—The external use of carbolic acid has become so general in the treatment of wounds that any unusual appearance which may attend its application deserves some notice. Physicians had observed that the urine is sometimes of a very dark colour in cases of poisoning by carbolic acid; but there are few, if any, records, except in German literature, of the same effect having been produced by the application of the acid as a dressing. M. Kirmisson, as *La France Médicale* informs us, has supplied a number of facts, chiefly from the practice of Professor Verneuil, confirming the statements of the German surgeons. In the great majority of cases the peculiar, almost inky, colour of the urine is the only change which can be detected; but when the carbolic-acid dressing has been applied to wounds involving large synovial or serous surfaces, the effects are often severe, and may be fatal. If urine containing a large proportion of carbolic acid be exposed to the air the change of colour is not observed. This renders it probable that the discoloration is produced by some transformation of the carbolic acid through the agency of atmospheric oxygen. The practical point, however, established by M. Kirmisson is, that the change of colour in the urine is not of itself a serious symptom, its chief value being a notice to the surgeon that the strength of the fluid employed must be considerably reduced. Very serious accidents, such as coma and convulsions, have been produced by neglect of this precaution.—*Medical Examiner.*

CARBOLATE OF SODA IN THE TREATMENT OF HOOPING-COUGH.—Dr Pernot considers carbolate of soda as a specific for hooping-cough. He writes in the *Lyon Médical* (quoted in the London *Medical Record*) that it is a heroic remedy, and would be almost a specific if hooping-cough could be cured at once. His cases have been numerous, and have presented the following general characteristics:—1. A notable diminution of the paroxysms of coughing after from two to ten days' treatment; 2. Less laboured and painful respiration; 3. Shorter duration of the paroxysms of coughing; finally, the most confirmed attack of hooping-cough remains *in statu quo* from the commencement of the treatment, and it always appeared to him to diminish more or less rapidly, but always in a time relatively short to its usual duration. Dr Pernot operates in nervous affections of the bronchi in the following manner:—He places the carbolate of soda in a small porcelain crucible held above the flame of a spirit-lamp, which keeps it at an unvarying temperature as long as wished; the carbolate of soda becomes volatilized, so that scarcely any of it remains in the crucible, but the atmosphere of the sick-room is impregnated with the vapour of carbolic acid mixed with the elements of coal-tar. The little apparatus above described is not always at hand, but a firebrick is generally to be had either in town or country, and this, heated to a sufficiently high temperature to vaporize the carbolate of soda, is generally employed by M. Pernot. He also speaks very highly of the disinfecting and antiseptic properties of these vapours of carbolate of soda. M. Dujardin Beaumetz states that when the carbolate of soda was tried in the children's wards of the Hospital St Antoine, although the results in hooping-cough were not quite so rapid as those obtained by M. Pernot, it acted very thoroughly in the disinfection of the wards.—*Medical and Surgical Reporter.*

THE EFFECT OF SALICYLIC ACID UPON THE TEETH.—A recent number of the *St Petersburg Medig. Wochenschrift* contains a communication from Dr Buch with reference to the solutions of salicylic acid as a wash for the mouth. He states that the remedy in question is very largely employed on account of its marked antiseptic properties. It has been found that a watery solution containing three parts per 1000 is fatal to bacteria, and such a solution Dr Buch had been in the habit of using when brushing his teeth. In a few weeks he began to experience a curious sensation; the teeth appeared softer than usual, and, on rubbing them together, there was a feeling as if something of a gritty or sandy nature were interposed. This led to the discovery that the salicylic acid in the solution entered into combination with one or more of the constituents of the teeth, and rendered the surface soft and granular. Dr Buch believes that a salicylate of lime is formed, which partially adheres to the teeth, and is the cause of the peculiar sensation when they are rubbed together. He therefore strongly cautions the public against using any preparation of salicylic acid as an ordinary lotion for the mouth and teeth.—*Medical Examiner.*

COMPARATIVE ACTION OF OPIUM AND MORPHIA.—Dr J. Ott gives the following comparison in a recent paper:—Opium *en masse* causes a sleepy, nearly narcotic, action, quickly disappearing, while morphia produces a deep and prolonged sleep. Morphia disturbs the stomach more than opium, and its action is more prolonged. Opium is in some cases better borne than morphia; in others the reverse happens. After either opium or morphia there is a period of excitation, which, in the case of morphia, soon passes into sleepiness, while after opium this excitement lasts longer. Opium causes a more lasting tingling in the skin than morphia or codeia, and constipates more than morphia, but does not cause as much diaphoresis. Morphia increases the urinary secretion more than opium. Dr Eisenmann, of Würzburg, has shown that opium increases the curative properties of all the heroic remedies, and diminishes their toxic. Bernard found that a subcutaneous dose of morphia causes the amount of chloroform for purposes of anæsthesia to be smaller in quantity.—*Medical and Surgical Reporter.*

GLYCERINE IN INTERNAL HÆMORRHOIDS.—Dr David Young, of Florence, reports (in the *Practitioner*) five cases in which marked and permanent benefit followed the internal administration of glycerine, in doses of from two to three drachms in water, night and morning. He says that the cases seem to show that we may be able to add glycerine to our list of palliatives for this troublesome malady. There are many patients who will not submit to surgical interference, and others—as, for example, consumptives in advanced stages of their disease—to whom one would scarcely recommend it, so that we are glad to welcome any means which would alleviate such a distressing condition. Not the least recommendation of this plan is, that it is both easy and pleasant, and probably also, especially in the case of phthisical patients, beneficial in some other respects. None of the patients to whom he has given it have experienced any difficulty in taking it; and when the sweet taste is an objection he usually orders a little lime-juice to be added to each dose.—*British Medical Journal.*

ERGOT IN CYSTITIS.—Dr Satterthwaite, of New York (*New York Medical Journal*, April 1878), warmly recommends the use of fluid extract of ergot, in doses of one drachm three times a day, in cystitis, with stricture or enlarged prostate.—*British Medical Journal.*

BROMIDE AND CHLORIDE OF POTASSIUM.—It having been suggested by Dr Binz, of Bonn, that the sedative effects of bromide of potassium are largely due to the potassium, and that possibly chloride of potassium might show similar therapeutic effects, Dr Seguin has made a comparative trial of the chloride in the treatment of epilepsy alongside of the bromide. The results were conclusive as to the value of the bromide, which reduced the attacks by 70 per cent., while in a number of patients treated consecutively by the bromide and chloride, it was found that the latter increased the number of attacks by 80 per cent. The chloride contains a larger amount of the potassium than the bromide.—*British Medical Journal.*

DIGITALINE INJECTIONS.—Professor Gubler, of Paris, states that after having made many attempts to utilize the active principles of digitalis in subcutaneous injections, he believes that he has attained his object. He uses a solution containing 2 per cent. of Homolle and Quevenne's amorphous digitaline in equal parts of water and alcohol. One gramme of this solution contains two milligrammes of digitaline. He injects half of the contents of the syringe—that is to say, one milligramme of digitaline, and obtains all the effects of digitalis. These injections do not bring on any local accidents. —*Medical and Surgical Reporter.*

PLANTAGO MAJOR, A REMEDY FOR TOOTHACHE.—An American homœopathic practitioner states that he has found in the *Plantago major* a sure remedy for toothache. It is, he says, the large-leaved plantain of the door-yard, hitherto known as a nuisance. He gathers it when the root has grown to full perfection. The leaves are chopped finely, packed closely in a bottle, and covered with strong alcohol for a week. By this time the bright green colour has changed to brown, and it is fit for use. In using it a piece of cotton-wool is saturated with the tincture and inserted in the cavity, and four drops of the same put in half a glass of water, of which a teaspoonful is taken. By rubbing it on the gums, it (one rubbing) was found to ameliorate the painful process of teething, and when inserted in the ear it is said to be equally efficacious in earache. As there are doubtless many plants of whose medicinal virtues we are perfectly ignorant, and as toothache is one of those torments which often baffles all attempts on the part of the physician to cure it, it may be worth while to give this reputed remedy a further trial—a trial which need not be delayed in the case of such a common complaint as that of toothache.—*The Medical Press.*

THE KORONIKO PLANT.—Seeing a paragraph in the *Evening Standard* of 10th May, referring to the Koroniko plant of New Zealand (erroneously spelt "roronicko") as a newly-discovered remedy for diarrhœa, I write to say that I can fully endorse the statement as to its efficacy as an astringent. I have often used it in an up-country district in Hawkes Bay, New Zealand, during the last four years, and have found it even more certain in its effects than the ordinary astringent mixtures. It is an old and well-known remedy amongst the Maories and up-country shepherds, especially for intestinal disturbances arising from drinking stagnant swamp-water in dry seasons. The usual method of using it is by making a strong infusion of the young leaves. The koroniko is a species of broom. I have no doubt that it would make a valuable addition to our *Pharmacopœia.*—*British Medical Journal.*

TAYUYA.—M. Louis Ubicini, of Milan, Italy, who for a long time resided in Brazil, discovered while there that a plant named Tayuya was extensively and very successfully employed by the natives in the treatment of syphilis and scrofula. He proceeded, after investigation of its properties, to export a quantity of the root to Italy, where he prepared a tincture which has since been largely employed and favourably noticed by several eminent Italian physicians, among them Dr Faraoni (who read a report on the subject, which has since been published, before the Medical Congress at Turin), Drs Ambrosoli and Bazzioni of Milan, Dr Kruch of Pavia, Dr Galassi of Bologna, and others. The dose of the dilute tincture is from two to twenty drops, according to the age of the patient—it is given in infantile disease — though the maximum named may be doubled and tripled in extreme cases, if cautiously administered.—*Chicago Medical Journal and Examiner.*

HYDRASTIS CANADENSIS IN UTERINE HÆMORRHAGE, etc.—Dr

Gordon, of Hamichal, Mo., states that he has for the last ten years made extensive use of the tincture of hydrastis in cases of uterine hæmorrhage, with such satisfactory results that he now seldom resorts to any other remedy. When the hæmorrhage is severe, he gives twenty to thirty drops of the tincture at short intervals, until the active bleeding is controlled. The remedy is then continued in doses of from two to five drops at longer intervals. When there is much prostration from loss of blood he combines the tincture of cinchona flava with the hydrastis. In menorrhagia, two to five drops of the tincture of hydrastis every two or three hours, or oftener, usually gives prompt relief. Larger doses may be used if necessary. After the flow is reduced to its normal quantity the minimum dose is continued twice a day until the next menstrual period, when, if necessary, the larger doses are resumed. In dysmenorrhœa dependent on chronic endometritis, from seven to ten drops of the tincture, with an equal quantity of a solution of bromine (gtt. j.–Oj.) three times a day, have given very satisfactory results.—*The Practitioner*, June 1878.

VERATRUM VIRIDE IN PUERPERAL CONVULSIONS.—Dr S. S. Boyd states that two years ago he read a paper advocating this plan of treatment, which was subsequently somewhat sharply criticised by various speakers and writers as being too hazardous. Dr Fearn, of New York, had, however, treated ten cases successfully, and his own two cases recovered; he was therefore not discouraged, and, on the first opportunity, made further trial of it, and he gives the details of another case. The patient was a healthy primipara, who, during delivery, had three convulsions at intervals of a little more than an hour. The child was at length born without instruments, except just to help the head through the superior strait. Half-an-hour after delivery an attack occurred which lasted five minutes. As soon as she was able to swallow, twenty drops of fluid extract of veratrum viride were given, and the dose was repeated every fifteen minutes till she had taken 120 drops. When the sixth dose was given, the pulse had fallen from 144 to 130 per minute. Ten minutes after this dose the patient vomited nearly a pint of tenacious mucus coloured by the veratrum. Within ten minutes after the emesis began the pulse fell to 54 per minute. After she had vomited three times in quick succession, twenty-five drops of tincture of opium were given, and this dose was repeated every time she vomited, which occurred at short intervals at first; but after the administration of the fourth dose of the tincture of opium she ceased to vomit, and fell into a quiet sleep. The patient was left with the pulse at sixty, and with instructions that, if the pulse rose above eighty, eight drops of the veratrum viride should be given every hour until the pulse fell below eighty beats. Two doses were given in the course of the two following days, and the patient made an excellent recovery. Dr Boyd, in cases of this kind, states that the effects of veratrum are due to its depressing influence on the heart and medulla spinalis and oblongata, believing that the eclampsia does not owe its origin to brain lesion, but is produced by reflex action originating in the uterus, from which through different nerves an impression is carried to nerve centres in the medulla spinalis and oblongata, from whence it radiates to the whole of the voluntary muscular system.—*American Practitioner*, Jan. 1878, and *The Practitioner.*

AN UNDESCRIBED EFFECT OF THE ACTION OF CHLORAL HYDRATE.—Ranke injected into the crural artery of a rabbit a ten per cent. watery solution of chloral-hydrate, and observed that, after a few fibrillar contractions, the muscles of the limb passed into a state of rigidity, resembling that which results from the injection of chloroform. But if a solution of hydrate of chloral be added to a solution of myosin no drops with myosin sheath or investment are produced as on the addition of chloroform, but well-marked rigidity is observed. Ranke concludes from this that the chloral-hydrate precipitates the albumen as chloral molecule, and that this in all probability occasions the muscular rigor. In conclusion, he warns practitioners of the danger of the injection of chloral into the veins with the object of producing narcosis, on account of its action on the heart.—*Bayr. ärztliche Intelligenzblatt*, No. 30, 1877, and *Practitioner*, June 1878.

Part Fifth.

MEDICAL NEWS.

PRESENTATION TO DR IRVINE, PITLOCHRY.

ON 28th May, Dr Irvine, Pitlochry, was entertained to public luncheon in Mr Fisher's Hotel, Pitlochry, and presented with a piece of plate in recognition of the valuable medical services he has rendered in the Atholl district for the long period of forty-five years. The articles embraced a massive silver centre-piece, valued at £100, and which was about 24 inches in height. From the base springs a richly engraved column, supporting the top vase. On either side of the central column are the figures of two Highlanders in the Atholl dress, and two stags' heads. There was also a massive silver tea and coffee service for Mrs Irvine, valued at £114, richly engraved with *fac-similes* of the Runic tombstones which are to be seen in the Antiquarian Museum of Edinburgh. Dr Irvine was also presented with a beautiful violet velvet purse, the needlework of Miss Butter of Faskally, and containing 270 sovereigns.

About 100 gentlemen sat down to luncheon. His Grace the Duke of Atholl presided; and he was supported on the right by the guest of the afternoon (Dr Irvine), and on the left by Mr Butter of Faskally. Among the gentlemen present were—Mr Butter of Faskally; Colonel Butter, younger of Faskally; Mr Stewart Robertson of Edradynate; Mr Stewart Robertson, younger of Edradynate; Mr Patrick Small Keir, of Kindrogan; Mr W. A. Keir, younger of Kindrogan; Mr H. Black Stewart of Balnakeilly; Mr Blair Stewart, younger of Balnakeilly; Mr James Small of Dirnanean; Mr George F. Barbour of Bonskeid; Mr R. W. Barbour, younger of Bonskeid; Mr David Lumsden of Fincastle; Mr S. R. Ferguson of Middlehaugh; Mr W. Dick of Tullymet; Lord Provost Richardson of Perth; Mr J. Grant Ferguson, younger of Baledmund; and, in fact, by nearly every laird, farmer, and professional man in the wide district in which Dr Irvine has so long laboured, with the result that all are his patients, and all his patients are his friends.

After the usual loyal and patriotic toasts, the chairman proposed the toast of the evening, "The health of Dr Irvine." He said, We are met together this afternoon for the purpose of acknowledging the worth of the gentleman on my right. (Applause.) It is not very easy to speak of a man in his presence, and I wish that this toast had fallen into the hands of one who would have done it better justice than I can. If my words are not in the right place, I can assure you my heart is. (Applause.) There is no one in Atholl who deserves more at the hands of the people of the district than my valued friend, Dr Irvine. (Applause.) For a period of forty-five years he has laboured amongst us. He was born amongst us, and he has been tempted to remain amongst us, doing all he could for his fellow-men. There can be no question that by going to some of the large southern cities he might have largely increased his income. For thirty-three years Dr Irvine has held the not very hard-worked post of surgeon to the Atholl Highlanders. I do not know, gentlemen, if you can picture to yourselves what the life of a country doctor is. I do not know what your feelings would be, if you had been driving about all day in a snowstorm in the Rannoch district, and on getting home to Pitlochry cold, wet, and tired, and after having dined and gone to bed, to be suddenly awakened and told that you were wanted in the Strathardle district. (Cheers and laughter.) That is the sort of life my friend Dr Irvine has led for many years. Though advanced in life, he is still fit for duty, and he has secured the active services of Dr Robert W. Irvine, who, I am glad to learn, seems to bid fair to become as popular as his worthy uncle. (Applause.) Dr Irvine, I have now, on behalf of those gentlemen present, and also on behalf of a large number of ladies and gentlemen absent, I believe nearly one thousand in number, to present you with this centre-piece, a tea and coffee service for Mrs Irvine, and this violet bag of sovereigns. I hope, Doctor, that you may be long spared to see this service on your table, and that the contents of this purse will provide you with tea and coffee, and with something to mix amongst the hot water. (Applause and laughter.) Gentlemen, I call upon you to drink to the health of Dr Irvine. (Prolonged cheering.) His Grace then read the inscription on the centre-piece, which was as follows (on one side in English, on the other in Gaelic):—"Presented to William Stewart Irvine, Esq., M.D., etc., with a purse of sovereigns, in token of the high esteem in which he is held by a large circle of friends of all classes, and as an expression of their gratitude for the able and valued services he has rendered in the district of Atholl for a period of 45 years. 1878."

Dr Irvine, in rising to reply, was received with loud cheers. He said it was impossible for him to express fully his thanks on the present occasion, but he had to thank the noble Duke for his great kindness in presiding, and all the other gentlemen for coming here to do him honour, and for presenting him with that magnificent testimonial. (Applause.) He remembered the time when he was first asked to enter on the duties of the district he had so long laboured in. He entered that position with great hesitation, although he had passed with the usual qualifications which a medical student required when leaving college, when he thought of the tremendous responsibility of taking charge of the health and the lives of a community so widespread as that in which he then engaged. During the whole of his practice he had charged himself with the responsibility of his calling. He felt bound to serve his patients to the best of his ability, and while he did so, he tried to please and serve them, while labouring to do his duty in a manner satisfactory to his own conscience. (Applause.) He never allowed a day to pass without learning something, and by this means he was able to keep abreast of the medical opinions of the age. (Applause.) He had not only the honour of being doctor to the noble house of Atholl, but of being the cherished doctor of all classes in the wide district of Atholl. It was not a matter of boast on his part, but he could say that he never refused a man, in any position of life, who asked his services. (Applause.) He concluded by thanking the subscribers for their magnificent gift, and by expressing the hope that all present would prosper, and would enjoy health and happiness for many years. (Applause.)

Dr Irvine then proposed "The House of the Duke of Atholl." He (the doctor) for many years received kindness at the hands of the Atholl family, and he might say that he would have been much disappointed that day if the Duke had not been able to be present and fill the chair. He had been acquainted with the present Duke ever since his birth; and he (the doctor) had now had the charge of five generations of the house of Atholl. It was his desire, so long as he was able, still to occupy the same position as he had done in the Atholl family.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*On the Modes of Administering Mercury in Syphilis.* By JOHN DUNCAN, Surgeon to the Royal Infirmary.

IN a former paper I ventured to formulate the views on the use of mercury in syphilis, to which several years' experience in the Lock Hospital had led; and as an appendix I am now tempted to record the result of certain observations on the modes of administering the remedy.

In endeavouring to estimate the comparative value of the different methods, it is plain that we may adopt two standards of comparison, the physiological and the therapeutic. Inasmuch as the discovery of the best manner of treating syphilis is the object we have in view, it is of course impossible to neglect the latter; but for the purposes of the present comparison, the former is certainly of greater value. It would, doubtless, be important to determine how far the various forms of mercury may produce a greater or less curative effect through their introduction into the blood. But the conditions vary so infinitely in the date and character of the disease, in the constitution of the patient, in the concurrence of other remedies, hygienic, dietetic, and medicinal, that we have found it difficult to obtain a sufficient number of parallel or fairly comparable cases. If it, therefore, be determined that mercury (using the word in its widest sense) is beneficial, we must rely largely on the physiological phenomena for the farther determination of the best modes of giving it. Even in this respect, doubtless, we are surrounded by fallacies. The local effects of the disease are apt to be confounded with the local actions of the remedy, and the idiosyncrasies of patients add to the confusion. Nevertheless, we have in the influence of mercury on the gums and the salivary secretion a test of its introduction into the system, which if not absolutely certain, is yet fairly reliable, and I may therefore be excused the frequent reference to it which I shall be compelled to make.

There are four principal methods by which mercury may be administered—by subcutaneous injection, by fumigation, by inunction, and by the mouth.

About two years ago I read a short note before the Medico-Chirurgical Society concerning some experiments on the subcutaneous injection of mercury. Since that time a second series of observations has been made, and with results which have somewhat modified the opinion then expressed.

On both occasions the experiments were conducted with the bicyanide, the biniodide, and the albuminous solution of the bichloride of mercury, and in the latter series with the bichloride in simple watery solution, in solution from Savory and Moore's lamels, and in combination with morphia. Very little variation was made in the amount injected at one time. A few injections of one-twelfth of a grain were tried, and it was found that the amount made very little material difference in the local irritation. It may be regarded, therefore, as likely that when rapid mercurial action is desired, it is possible to obtain it in this way. But almost invariably, and for every preparation, one-sixteenth of a grain was used, and the observations I have to make refer to this quantity. The injections were made once in 24 hours until the gums were slightly touched, after which, according to circumstances, they were left off altogether or used every second or third day.

I think I may say that one of the most striking results of these experiments was, that we were unable to detect any distinct difference in the action of the various forms of mercury either locally or generally. The observations of others had led us to expect that the bichloride would prove exceedingly irritating and unsatisfactory. We knew that various attempts had been made to overcome this by combining it with morphia, and by converting it into an albuminate. When, therefore, in the first series, we found that the pain and induration which these and all other mercurial preparations caused were very considerable, we did not venture to experiment with the pure bichloride. We had found that at the point of injection there arose a swelling sometimes as large as a walnut, painful, and often persisting for two or three weeks. This was less palpable and less painful if the injection were made deeply, and on the back, shoulder, or buttocks, than if it were simply subcutaneous and on the limbs; but the difference was probably due to the relative exposure to injury and the sensitiveness of the parts. Out of more than two hundred injections there was only one instance in which a tardy suppuration followed the little operation; but the condition of a patient with twelve or fifteen of these tender spots was anything but pleasant, and, in point of fact, a mutiny threatened, and the injections were discontinued. Our second series coincided with the first in so far as similarity between the actions of the various preparations was concerned. But the local irritation was much less. It seemed to be of trifling

importance in what portion of the body, or at what depth, or with what preparation, injection was made. The pain and induration were always very small, and the maligned bichloride which we now ventured to try was very little worse than its neighbours. I have found it difficult to determine the reason of this difference in result; but I believe that it was due to the most scrupulous attention to cleanliness on the part of my house-surgeon, Dr Kirk.

In all other respects the results of the observations were parallel. I shall not enter into details of cases, but sum up the advantages and disadvantages which appeared to attend this mode of using mercury.

Half a grain was the smallest amount which sufficed to touch the gums. A grain and a half was the largest necessary. The average of all the cases gave a little over fourteen injections as the number required to produce salivation. The precision with which mercurial action was produced was thus very satisfactory, and the total amount of the drug introduced into the system was exceedingly small. Gentle salivation could be afterwards kept up with very great certainty by injecting every second day, with slight variations in the sense of greater or less frequency. Only in one instance did the remedy seem to produce disorder of the stomach and bowels, but as is invariably the case with mercury, lassitude and anæmia manifested themselves if the cure proved tedious. On the other hand, I do not think the therapeutic effects differed from those of other modes of exhibition, and there is no doubt that patients strongly object to the continued use of the needle and the production thereby of a number of spots, which, if not exceedingly painful, are yet tender on pressure.

Fumigation.—In directing our attention to mercurial fumigation we did not fail to try various forms of apparatus. We found that for practical purposes the best was a simple porcelain dish divided into two compartments, one containing the mercury, the other an ounce or two of water. This is placed on a tripod with an ordinary spirit lamp below it. Along with the patient it is enveloped in blankets or tarpaulin, being covered by a large cage if the patient be in bed, or by the chair if he be seated. The water is not essential to the process, but seems to render it more comfortable, and aids the production of perspiration. Calomel is in all respects the best preparation of mercury that can be used.

We thought it well, in the first place, to endeavour to estimate the value of fumigation alone as a means of introducing mercury into the system. If twenty grains of calomel be volatilized, and the patient be exposed daily to its influence for twenty minutes, no signs of mercurial action are produced; and even though forty or sixty grains be used, the gums are touched in comparatively a small proportion of cases, and after a long time. The baths were given in the general ward. The patient was absolutely nude, and was put to bed afterwards for an hour or two.

If, on the other hand, the bath be administered in the manner recommended by the advocates of this method,—that is, if the patient be directed to take each time a few inhalations of the fumes, if ablution be forbidden and the underclothing impregnated by the fumes be retained in contact with the skin, then with only twenty grains of calomel salivation may be produced in most cases with considerable rapidity.

The evident conclusion from these experiments is, that while the quantity of mercury absorbed by the skin is insufficient to produce palpable evidence of its presence in the blood, yet so much is thereby taken up as to make it easy to produce this action by other means, such as inhalation. We had incidental proof of the risk of inhaling too freely, and so of the impropriety of attempting to introduce mercury by the lungs alone. One patient who, contrary to orders, kept her head under the blanket for several minutes (she said as long as she could) suffered in consequence from a very severe attack of bronchitis. No doubt the few breaths which are necessary to the method may be drawn with impunity, at least, so far as evident injury is concerned; but it is a subject for consideration whether administration by the mouth might not be advantageously substituted for inhalation. We found that the exhibition by the mouth of a teaspoonful of the liquor hydrargyri bichloridi twice or three times a day produced salivation with great certainty and rapidity when combined with mercurial fumigation, although that quantity is very slow of doing so when given alone.

The therapeutic effects of mercurial fumigation are very good. A certain class of cases improved, I think, more rapidly in this way than under any of the other common modes of treatment. It apparently acts by three distinct processes—the introduction of mercury into the system, the production of diaphoresis, and the topical effect of the remedy. Of patients who come into the Lock Hospital, there can be no doubt that a large number derive benefit simply from the improved dietary, greater cleanliness, and attention to the primæ viæ. In a considerable number of cases I have limited the additional treatment to the daily vapour bath, and the benefit derived from the copious perspiration thus induced has often been very striking. Experience, moreover, would lead me to believe that the action of mercury, however it be administered, is much improved, both in hospital and private practice, by some such means. The Turkish bath, two or three times a week, is admirable, but for the risk of catching cold after it, an objection however, which cannot be raised to the daily vapour or hot-water bath at home. But the method of fumigation has yet another advantage. In the experiments which we made without inhalation we were struck by the satisfactory progress of our patients. I was not inclined to believe that the action was purely local, because I found that sore throats, iritis, and other manifestations of syphilis which did not come in contact with the vapour, improved under the treatment; but I felt certain that it did produce a topical effect. Of all forms the affections of the skin are those which receive benefit most speedily, and in general eruptions I have frequently noted that those portions which were most exposed to the mercurial fumes were precisely those which most speedily disappeared. In one case of squamous syphilide affecting the body and scalp, the disease disappeared on the body before any improvement whatever had shown itself on the head. Such an effect, indeed, one would be prepared to anticipate from the well-known beneficial action of mercurial unguents, and lotions, and powders, in syphilitic diseases of the skin.

But, on the other hand, mercurial fumigation doubtless has its disadvantages. The absence of ablution and the retention in continuous use of the impregnated clothing, if they be insisted on, render it peculiarly distasteful to those who are of cleanly habits. But whether or not these precautions be used, if the hot vapour baths be continued daily for any considerable time, they come to have a seriously-depressing effect on the patient. This languor and anæmia, moreover, to which syphilitic patients in hospital are prone, to which mercury conduces, and which is intensified by the vapour bath, occurs in spite of the most sustaining and tonic measures. I have already pointed out that there is a period in the continuance of mercurial administration, varying in different individuals and in different phases of the disease, at which the remedy not only ceases to do good, but actually becomes injurious, and tends to prolong the syphilitic manifestation. This injurious effect, it seems to me, shows itself soon and distinctly under mercurial fumigation.

Our observations on the method of treatment by mercurial inunction present little worthy of remark. In some patients we used the ordinary mercurial ointment, in a good many the ten-per-cent. oleate of mercury, and I think that the only difference to be noted is that the latter is somewhat less uncleanly than the former. Having prepared the skin by soap and water, and the patient by a gentle aperient if necessary, we proceeded with the treatment. We divided the body into ten regions, and used a different region for inunction each day. The rubbing was continued for twenty minutes on each occasion. The ordinary physiological effects were, on the whole, produced with regularity. There were, however, notable exceptions. Thus, in one patient we had distinct salivation on the fifth day, while in another the gums were not touched, after daily rubbings, for a period of four weeks. Doubtless peculiarities of this kind present themselves, whatever be the mode of introducing mercury into the system, but they appear to be more common with inunction than with other methods. The divergence may, perhaps, be explained by the fact that we have here to deal not only with constitutional idiosyncrasies, but also with variations in cutaneous absorption. Doubtless in most cases these peculiarities may be expected to neutralize each other, but when coincident in one direction or other, they produce the extreme results to which I allude. This method has the disadvantage of being uncleanly, and it is not free from the risk of producing injurious effects on the digestive organs and general system. I do not think that its therapeutic action differs in any material respect from that of other methods.

I shall not detain you with details of cases wherein mercury was administered by the mouth. Every one, doubtless, has his favourite preparation and peculiar mode of using it. I shall venture merely to indicate certain general conclusions.

In the first place, I would observe that the advocacy of particular preparations is not warranted by any special advantages which are possessed by one as compared with another. In suitable dose, all the preparations in common use may be made to touch the gums and produce the desired constitutional and therapeutic effects with nearly equal facility. With all of them there is the same tendency to produce digestive and other derangements, and if proportionate doses be administered with equal frequency, this tendency is not markedly greater with one preparation than with another.

In the next place, there can be little doubt that, for the end in view, small doses, frequently repeated, are better borne and more effectual than larger administrations at longer intervals. With the bichloride, for example, a teaspoonful of the liquor given four times a day is less likely to produce irritation than a dessert-spoonful twice a day. Lastly, it is of importance that the patient be prepared for the exhibition of the drug by careful attention to the general state.

There only remains for me to say a word as to the preference to be given to one of these modes of administration over the other. I think there can be no doubt that the majority of cases in private practice, when they require mercury, are best treated by the oral method. If small doses be given in the first place, and gradually increased in frequency till the desired effect be produced, the chances of gastric or intestinal irritation are easily avoided, and salivation can be prevented by the use of chlorate of potash, or alum wash after each dose. The patient is thus permitted to follow his usual avocation, and the remedy may be continued, with proper precautions, as long as may be needful. With the other methods it is difficult, from their inconvenience, uncleanliness, or disagreeableness, to induce the patient to persevere sufficiently long; and one strong objection to the routine use either of mercurial fumigation as practised by Mr Lee, or inunction as practised by Sigmund, lies in the necessity for confinement to the house, and even for a considerable portion of the day to the recumbent position. Exercise in the open air, a nourishing dietary, and even a certain amount of stimulation, especially in chronic cases, are of great importance, whatever be the way in which the mercury be given. I have already said that free action of the skin is very desirable, and the occasional use of the vapour bath is a good method of securing it. In obstinate cases of skin affection, an occasional mercurial vapour bath may advantageously be added, and in hospital cases mercurial fumigation is probably the most efficient plan, at all events, to begin with.

I do not think that inunction and subcutaneous injection hold out sufficient inducement to employ them, otherwise than as exceptional measures in cases of peculiar weakness or individual idiosyncrasy.

ARTICLE II.—*The Risks and Treatment of Intrauterine Hydrocephalus as a Complication of Labour, with the History of a Case.* By ANGUS MACDONALD, M.D., Physician and Clinical Lecturer on Diseases of Women, Royal Infirmary, Edinburgh, and Lecturer on Midwifery and Diseases of Women and Children in the Medical School.

(*Read before the Edinburgh Obstetrical Society, 8th May* 1878.)

INTRAUTERINE hydrocephalus occurring only once in 3000 cases, or thereby, is sufficiently rare to warrant the practitioner in recording cases as they arise in his experience. Besides this, the lesion, though unfrequent, is so beset with difficulties and risks that it is a duty to keep those occasionally before the profession, in the hope that, attention being rivetted upon them, the accidents likely to arise in connexion with this complication of delivery may thereby be avoided.

Considerations such as these must therefore be accepted as my apology for reading this paper before the Society.

The following are the main facts of the case:—

I was called on the forenoon of Tuesday, the 2d of December last, to assist my then dispensary pupil, Mr Greathead, in the treatment of a Mrs Hughes, the wife of an engine-driver, residing at 3 Cottage Lane, Stockbridge. She was then being confined of her third child. She stated that during her first confinement she had been attended by Dr Cappie. Her labour on that occasion lasted from Thursday to the following Sunday, when it was terminated by forceps. The infant lived for five months. The second confinement was natural, the infant, a boy, being still alive, and aged fifteen months. The patient believes she suffered from prolapsus uteri in May 1877. She had arrived at or near her full time when labour supervened.

During the whole previous day, the 1st December, the patient had pains at irregular intervals. In the evening, on lifting a tub of water, the pains came on with considerable severity and regularity. Mr Greathead was accordingly sent for, and, on his arrival, found the external os flaccid and dilated to about the size of a florin. The membranes were observed to be protruding a good deal, and they were accidentally ruptured during the first examination. The presenting part was high placed, so that it was impossible to make out the presentation. Something that appeared to be hair was felt, but no bones could be detected. The feel of the presenting part was that of a doughy mass that pitted on pressure.

The fœtal heart's sounds could be heard at the most common situation on the left side of the abdomen of the mother. But Mr Greathead could not hear the uterine souffle, owing, as he thought, to the effects of the extremely persistent uterine contractions.

After waiting for some time, and the pains appearing to have rather gone off, the patient was left for the night. On visiting her at 9.30 A.M. on the 2d, it was found that she had not been able to sleep, and that pains had been off and on all night. She was now greatly distressed, and complained of a very tight sensation round the lower part of the abdomen, feeling as if she should burst. On examination, per vaginam, the condition of matters was much as on the previous evening, only that the head was more closely pressed down upon the upper part of the pelvis.

I saw the patient about twelve noon. Felt the head presenting, soft, high up, and doughy, and at the same time satisfied myself that the pelvis was narrowed antero-posteriorly. The parts were very tender, and I did not examine with so much care as usual in consequence of this state of matters. I accordingly sent for forceps. When these arrived, and the patient had been put under the influence of chloroform, as is my wont, I again examined to make certain of the exact position of the head, and the relation it had to the pelvis, before introducing the instruments. I now discovered that the head presented the posterior parietal bone, and that the sagittal suture was situated transversely, running immediately behind the symphysis pubis. The posterior fontanelle was a wide triangular space, measuring, so far as I could judge, about 2 inches by 1½, and turned towards the right. The sagittal suture freely admitted one or two fingers between the opposing bones, and, on tracing it toward the left side, I found it terminated in a wide quadrilateral space (anterior fontanelle) that was nearly the size of the palm of the hand. The left side of the head could be felt, now that our attention was directed towards it, projecting fully two inches above the upper edge of the symphysis pubis. The anterior portion of the cervical segment of the uterus was markedly distended and thinned, so that one felt as he were touching the head through the abdominal walls. The lower edge of the body of the uterus was felt as a distinct transverse rim about two inches above the upper edge of the symphysis pubis—the body of the uterus being soft and thick when the pains were absent—hard and firm when the pains were present. These facts were all tested by Dr Playfair and Mr Greathead, who were along with me. It was extremely interesting to notice how distinctly the horizontal elevated line of separation between body and cervix was developed during each pain. The pains were manifestly strong, though they did not move the head.

I now came to the conclusion that I had got to deal with a large hydrocephalic head, and the more thoroughly I explored the state of the presenting part, the more my opinion was confirmed. Dr Playfair likewise examined the head, and agreed with me. I now applied forceps guardedly, but they slipped. I reapplied them with like result. I now sent for craniotomy instruments, and a trocar and canula.

On obtaining the latter, I punctured the child's head, and on the withdrawal of the trocar, a large quantity, apparently about two pints, of clear fluid escaped through the canula. The head thereupon collapsed, and began to enter the pelvis under the propelling influence of the pains.

The patient, however, was so much exhausted that the labour made but little progress, and I had to finish it by applying forceps in a hooked sort of fashion over the collapsed head. On the first trial they slipped, but on the second they were able to pull the child's head through the pelvis. Though the head was completely collapsed, the child breathed for fully forty minutes. It was, except the head, a well-formed male child.

The placenta came away about ten minutes after the child. Shortly afterwards there was some post-partum hæmorrhage, which was at once checked by the injection of three grains of ergotin subcutaneously. The uterus quickly contracted powerfully, and remained so.

The diagonal conjugata of the pelvis was found to measure 4¼ inches. The hand could not be turned round in the brim. On careful measurement of the part of the hand that could be admitted into the brim, I came to the conclusion that the conjugate of the brim was not over 3½ inches. The patient made a good recovery.

The first remark that I would make regarding this case is the difficulty of diagnosis. It will be noticed, that on my first examination I entirely failed to detect the then state of matters. But though, on a careful examination, that was easily enough effected, and more especially when chloroform was employed to assist me, it is not so very strange that the lesion was not observed on the first exploration. It is another illustration of the well-known problem, said to have been first suggested by Columbus, how to make an egg stand on end. It was easy enough to make the diagnosis when one knew all about the case, and suspected its presence.

But it is to be remembered that the patient was believed to have a contracted pelvis, that her first labour in consequence had been very severe, and that my attention was especially directed to ascertain whether there was such contraction, and what was its amount. Having satisfied myself that the pelvis was narrow, and that delivery could not be effected by the natural efforts, and at the same time that the contraction was not greater than forceps ought readily to overcome, I naturally sent for instruments. But before applying forceps it is of the utmost importance to determine with accuracy the exact position of the head. For though in the high operation one must necessarily apply the blades of the long forceps in relation to the sides of the pelvis only, yet the traction and management of the instruments must be regulated so as to favour the natural mechanism of the individual positions as far as possible. But I am not singular in experiencing some difficulty in the diagnosis of this accident. The difficulty has been experienced and pointed out by nearly every writer on the subject. Thus, Sir James Y. Simpson,[1] after recommending the patient to be first chloroformed, states that "the unusual size and dimensions of the head might be thus ascertained; but one source of fallacy was to be guarded against, namely, that the sutures and fontanelles were not, as was usually described, always preternaturally open and enlarged in hydrocephalic cases; for the cranial bones were in some instances, where the internal effusion was very great, so largely and abnormally developed as to destroy this supposed pathognomonic sign, and to form an almost complete osseous covering for the enlarged head." Also, Playfair[2] affirms "that the diagnosis of intrauterine hydrocephalus is by no means so easy as the description in obstetrical works would lead us to believe. It is true that the head is much larger and more rounded in its contour than the healthy fœtal cranium, and also that the suture and fontanelles are more wide, and admit occasionally of fluctuation being perceived through them. Still it is to be remembered that the head is always arrested above the brim, when it is consequently high up and difficult to reach, and when these peculiarities are made out with much difficulty. As a matter of fact, the true nature of the case is comparatively rarely discovered before delivery. Thus Chaussin (*Gazette Medical*, 1864) found that in more than one-half of the cases he collected an erroneous diagnosis had been made." Leishman[3] recognises the difficulty of forming a correct diagnosis, especially in head-last cases of intrauterine hydrocephalus, but is hardly so frank as Playfair in allowing the likelihood of mistake.

Spiegelberg[4] expresses himself thus:—"The diagnosis is not difficult if the cranial bones are very movable, and the skull represents more a loose sack filled with fluid than a solid body. In that case one feels the scalp in or above the brim tight during the pains, slack during the intervals, and recognises through it (the scalp) the sharp radiating edges of the bones. The widely gaping sutures and fontanelles are generally the most certain and most easily recognisable signs. But this condition is not always present. Exquisite cases of hydrocephalus occur, in which the distended structure in the sutures are extensively ossified, and in this respect present no difference from the healthy skull, or in which the bones are not thin like paper, but strong and thick, so that the softness and fluctuation of the skull are wanting. And, conversely, one finds now and again skulls of ordinary size in which the ossification is so backward that the sutures appear wide and gaping as in hydrocephalus. In such doubtful cases the most reliable signs of the latter is the abnormal relation between the face and the brow, the breadth and prominence of the latter, with the gaping frontal suture, and the transition of it (the brow) into the small face at a projecting angle. If we are unable, on account of the high position (of the presenting part) to accurately explore the head by touch, or if the child presents the breech, we are driven back upon the evidence afforded by external palpation, and the existence of a very voluminous and yielding head, which it is not of course always possible to make out." But I need not multiply extracts all tending towards the same conclusion. Enough has already been given to prove that the difficulty of diagnosis is a real and serious one.

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[1] *Selected Obstetrical Works*, p. 385.
[2] *The Science and Practice of Midwifery*, p. 44.
[3] *A System of Midwifery*, 1st ed., pp. 642–3.
[4] *Lehrbuch der Geburtshülfe*, s. 525, Lohr., 1878.

But, furthermore, the usual obstacles to the forming of a correct opinion were increased in the case before us by the presence of a deformed pelvis, which, whilst it kept the hydrocephalic head high up, at the same time offered in itself an apparently sufficient explanation of the high position, independently of there being anything amiss with the head itself. The condition of the sutures and fontanelles were such, however, as to leave little doubt as to the real state of affairs, whilst any possible uncertainty was readily removed by the convincing evidence of combined external and internal palpation. This proved that the size of the head was very much greater than normal, and also from the extreme thinning of the cervical segment of the uterus, showed in how great danger the patient was placed, provided timely assistance was not rendered to her.

It ought never to be forgotten, however, that a hydrocephalic head is occasionally diagnosed to be present when there is only a loose state of the cranial bones of an ordinary sized head, in consequence of death of the fœtus and collapse of the cerebral contents. On at least two occasions I have been sent for to aid in delivery when this mistake had been made. On one occasion it was in consultation with a medical friend, who had worked himself into a state of real alarm, and had considered it necessary to attempt a forcible dilatation of the cervix in order to avoid the evil consequences of the imaginary hydrocephalus. On this occasion a curious phenomenon occurred, which I am not sure whether I ever observed before or since, but which I have seen lately noticed in a German periodical, on which I unfortunately cannot now lay my hands. What I refer to was a peculiar thrill audible on auscultating the abdomen, which exactly imitated the fœtal heart as to time and intensity, but which was clearly occasioned by muscular vibration. On my suggesting to my friend that we had got to deal with the collapsed head of a dead child, he triumphantly asked me to auscultate the abdomen. The sequel, however, proved that I was correct, as the child was by-and-by born dead and putrid.

Less than ten days ago, one of the most experienced and intelligent of my dispensary pupils called me to assist him in what he thought to be a hydrocephalic head. But on our arrival we found that, in the interval, a dead and putrid, but not hydrocephalic child, of more than usual size had been born.

It is thus manifest that there is great risk in mistaking the collapsed head of a dead child for hydrocephalus, and thus to diagnose the presence of the latter where it is non-existent, as well as the other danger of failing to detect it when it is present. No correct and experienced observer, however, ought to confound the collapsed head of a dead fœtus with a hydrocephalic head, provided only a little attention is paid to determine the size of the head.

According to the statistics of Scanzoni, once in every five of all cases of intrauterine hydrocephalus the fœtus presents the breech. This also, as pointed out in the observations of Leishman and Spiegelberg already referred to, increases the difficulty of diagnosis, but improves the chances of safe delivery, as the head when it comes last presents the narrow end of a specially thick wedge at the inlet of the pelvis. It is thus more likely to get moulded into the shape of the passages and to pass through.

The history of obstetrics, however, proves that this is a rare result even with head-last cases.

Let us now consider the effects of hydrocephalus of the fœtus upon the course of delivery. In certain head-first cases, if the enlargement is not too great, and the bones movable, the head may be moulded into the shape of the pelvis and thus be forced through in detail, in a manner similar to what takes place in a narrow pelvis after the head has been crushed to a pulp by repeated applications of a powerful cephalotribe, such as Baudelocque's.

The great bulk of the cases, however, need to be assisted in some way. Thus, in 94 cases collected by Hohl and Boehr, and referred to by Spiegelberg,[1]—I unfortunately have not been able to get hold of the original works,—spontaneous delivery occurred in only 21 cases. In 8 cases treated by F. Weber,[2] St Petersburg, delivery was spontaneous in 4. In 2 cases, by Massmann, lately reported, assistance was needed in both cases. In 5 cases, recorded by Dr R. Lee,[1] artificial delivery had to be performed in all. Thus, in 109 cases taken at random from medical records, only 25, or less than one-fourth of all the cases, were terminated by the natural powers.

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[1] *Lehrbuch der Geburtshülfe*, s. 527.

[2] *Centralblatt für Gynakologie*, s. 212. 1878.

If, however, the necessity of operative interference, even at the expense of the life of the child, were all that happened, we should be very glad, inasmuch as very few of these children are worth rearing. Even when born alive they are usually found to succumb to the disease in a very short time. But the complication brings with it varied and serious risks to the mother.

Foremost among these is uterine rupture. Thus, in 74 cases collected by Dr Thomas Keith in his Graduation Thesis, this fearful accident occurred sixteen times. It occurred twice in the five cases recorded by Dr Lee. Both the cases reported by Massmann ended in rupture. Spiegelberg states that, in the 94 cases to which he refers, there were twenty-four maternal deaths. He does not, however, state what was the special cause of death in the cases.

Though rupture seems the most common cause of death, yet others, such as exhaustion and metritis, contribute their *quota* to this mournful list of causualties. Thus, in the remaining three cases recorded by Dr Robert Lee, metritis proved fatal in two, and metrophlebitis in the third.

If now rupture of the uterus is, out of sight, the most frequent serious accident that is apt to arise from intrauterine hydrocephalus, it becomes of importance to understand clearly how it is developed.

Our ideas have been very greatly cleared up on this subject by the recent researches of Braune,[2] Bandl,[3] and Litzmann,[4] upon the behaviour of the cervix during parturition. Of these authors, however, by far the foremost place is due to Bandl, who has amplified, elaborated, and systematized our knowledge of the causation of uterine rupture much more than any other single author.

It may not be out of place here to quote, before referring to Bandl's view, the description of the mechanism of rupture in connexion with intrauterine hydrocephalus, as given by Sir James Y. Simpson,[5] showing as it does by contrast how much our views have became steadied since the period at which he wrote. I may at the same time be allowed to remark on the beauty and force with which the view, though inaccurate in several important particulars, is expressed by Sir James. It is as follows:—

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[1] *Clinical Midwifery*, 2d edition, p. 56. London, 1848.

[2] *Homolographic Sections*. Leipsig, 1872.

[3] *Ueber Rupture der Gebärmutter und ihre Mechanik*. Wien, 1875.

[4] *Das Verhalten des Cervix Uteri unter der Gebart*, *Archiv für Gynäkologie*, Bd. x. s. 410.

[5] *Selected Obstetrical Works*, edited by Dr J. W. Black, p. 385.

"In fact the diseased head of the infant, distended by the effused fluid, acted under impressions conveyed to it by the body and spine of the infant during labour like a hydraulic bag or machine pressing equally and in all directions on the cervix uteri, or parts with which it was in contact, with a force under which these compressed structures were almost certain to rend, provided the pressure was of any great duration; because the force itself contained the sum and concentration of the whole power of the uterine contractions bearing on each point with which the bag of the head was in contact. Under such compression any weak or fissured part was almost certain to yield. And if any hydrocephalic head or fluid bag of this kind passed into the vagina and remained there, the kind of universal compression of the vaginal walls to which it gave rise was apt, if it did not lead to direct rending and laceration, to produce, if long continued, a sloughing inflammation in these parts."

This explanation seems to me to rest upon an entirely incorrect analogy. The underlying idea seems to be—I say seems, because the statement of the condition of the mechanism is very indefinite, though elegant—that the whole expulsive powers of the uterus are transmitted through the child's spine on to the hydraulic bag which its head forms. As the section of the child's spine is, where it joins the head, relative to the large head very small, and as the whole uterine forces are assumed to be concentrated on this small area, it follows that the amount of pressure that would be communicated by the spine to the part of the bag against which it is pushed, would be very great. But according to the law of hydrostatics, known as the "qua-qua *versus* principle," it would follow that the whole surface of the child's head must necessarily be subjected to a tension equal to the tension of that section, since the entire surface of the fluid contained in the head must be of equal tension. Accordingly, the cervix and lower segment of the uterus, in so far as they were brought in contact with the hydrocephalic head, would be subjected to a pressure, the amount of which would be equal to as many times the sum of the uterine expulsive powers as the area of the hydrocephalic bag in contact with the uterus contained the area of the child's spine. This state of matters, if true, would certainly give very great rending and distending force; but even these would not warrant the statement, that the force itself contained the sum and concentration of the whole power of the uterine contractions bearing upon each point with which the bag of the head was in contact. For there is a great difference, even assuming all the conditions we have pointed out to be true, between the *area of the child's spine* and a *point*. But there is no good reason to assume that any such condition of circumstances exist in the case of hydrocephalus.

It is now generally allowed that the uterus contracts in such a manner as to establish—1*st*, A uniformly equal tension over its interior, and which is the only kind of tension that is operative so long as the cervix is not completely dilated and the waters are unruptured; and 2*d*, A force that acts upon the poles of the ovum, and that arises from the resistance offered by the contracted fundus uteri to the straightening out of the fœtus, which, again, is occasioned by the change of shape and diminished capacity of cavity impressed upon the uterus by the contraction of the rest of its walls. This force thus occasioned acts upon the fœtus in the direction of the long axis of its body, and if the lower part of that body is unresisted, this part of the fœtus is necessarily propelled forwards. If, again, the lower pole is prevented by resistance in the direction of cervix from advancing, the effect of this axial pressure is to exert strain upon the resisting parts proportional to itself. The uniform uterine contractions likewise propel the presenting front of the fœtus through the genital passage, but they act so as to advance the ovum as a whole, and the presenting part of the fœtus as a part of that whole, whereas the axial pressure tends to propel the presenting part in advance of the rest of the ovum, as it were. Lahs of Marburg denies that there is ever such axial pressure as distinct from the general internal pressure. Numerous facts, however, seem to render it nearly certain that it does exist. Thus, we frequently observe the head of the child pressed tightly against the inlet during a pain, whilst the breech is at the same time squeezed hard against the fundus, although the latter does not coincidently descend, which it would do if the pressure were solely due to general and equable contraction of the uterus. It has also been shown incontestibly by Braune, Ahfeld, Sutugin, etc., that the fœtal oval is distinctly elongated during a pain—even to the amount of about 2½ inches. It does appear to me impossible that this elongation could take place without inducing a certain amount of active tension upon the poles of the fœtal oval. The former power of the uterus is called by Schatz *Der algemeine inner Uterusdruck*, the general internal uterine pressure. The latter is called *Die Formrestitutionskraft des Uterus*, *i.e.*, the form restorative power of the uterus, because he regards it as the consequence of the force with which the uterus strives to assume the globular form, but is prevented from so doing by the stretching-out of the fœtus. The same force is also termed by German authors *Der Fruchtaxendruck*, or fœtal axis pressure, because it acts in the direction of the fœtal axis.

But all authorities agree that the former of these processes is by far the most important, and that under certain conditions it alone may complete delivery, and that it is present in every stage of labour.

The latter force, again, is always subordinate to the former in amount, and very seldom comes into play during the first stage of labour, or at least never before the membranes are ruptured. It is chiefly operative during the second stage of labour. It is also agreed that this force that acts through the two poles along the axis of the fœtus is less in proportion to the degree with which the uterus can maintain the globular form.

Now, in every case of hydrocephalus the greatest danger arises during the first stage, before the outer os is completely dilated, when the general internal pressure is active, but before the fœtal axis pressure could come into play in an appreciable amount.

Furthermore, the great size of the fœtal head and the usually imperfectly developed body of the fœtus cannot but serve to retain in such cases an unusually globular form in the fœtal oval, so that the usual elongation of the child's body could only occur imperfectly or not at all.

From what we have here said, it appears to me proved that the doctrine of intensified expulsive action directed by the spine of the child upon the hydraulic bag formed by its head can only apply to an exceedingly small amount of the uterine force, viz., that fraction of its amount which can be regarded as the fœtal axis pressure. But it must be remembered that if the rupture arises before the entire os uteri is fully developed, that fraction must be very small, as the force is then little, if at all, existent.

It seems, therefore, certain that we cannot regard the fœtal axis pressure as an efficient cause in rupture when it arises in the course of a labour complicated with hydrocephalus, as we have reason to believe the rupture usually takes place before that force is brought into efficient operation.

But at least one other objection of an entirely different kind can be urged against this theory. It is this, viz., that when the head is strongly ossified, rupture is quite as likely to occur, if not more so than when the ossification is the most incomplete; but in the former case the notion that the head can act as a hydraulic bag is clearly a mistake.

I have selected for discussion the explanation of rupture in connexion with hydrocephalus lesion by Sir James Y. Simpson, simply because it is the only attempt at an explanation of the accident that I could lay my hands upon in the literature of the subject previous to the able contribution of Bandl.

It is clear, however, that Sir James's explanation will not account for the frequency of the complication. If not, how is its occurrence to be explained? We must dismiss from our minds all idea of a great axially-produced tension, and regard the large head and small body of the child as forming a large plastic mass more or less rounded in shape, about which the uterus contracts itself powerfully in its efforts to dilate the cervix and outer os sufficiently to admit the head to pass. But we know that during delivery the cervix uteri is distended, thinned, and thereby weakened, whilst the body of the uterus is contracted, thickened, and thereby strengthened. The true explanation of the accident, therefore, is to be sought in a correct appreciation of the different modes in which these two great segments of the uterus behave during delivery. In a paper contributed last summer to this Society, I drew attention to the different *rôle* played by the head and cervix uteri during labour, and endeavoured to explain the mechanism by which the cervix could be distended, and yet the integrity of its tissue under ordinary circumstances maintained.

But under extraordinary circumstances, as when a hydrocephalic head is presented at the brim, the distension of the cervix under the strain put upon it by the general internal pressure of the uterus is simply enormous, as is shown diagrammatically by the plate of Bandl's I laid before the Society. At the same time there is a complete absence of the distending force in the transverse direction at the outer os, which is effected by the presenting portion of the fœtus when it is of ordinary dimensions, so that the outer os dilates at a very great mechanical disadvantage, and therefore very slowly. In consequence of this the outer os may be found to be small, and the practitioner may believe there is no hurry, because the os is still undilated, whilst the upper part of the cervix may be meanwhile as thin as paper, enormously distended, and on the point of rupture.

This state of matters may go on long, but it is extremely apt to lead to rupture. It is the mere bulk of the presenting part, however, leading to over-distension of the cervix, and not any hydraulic-machine character that it possesses which induces rupture. Indeed, it is a well-known fact that it is exactly in such cases as, if the wedge theory had any meaning, would produce rupture that we are most apt to meet with natural delivery. I mean those cases in which the head is so soft as to become moulded into the shape of the passages, and to pass the cavity in detail.

The rupture in cases of this kind is stated to be chiefly longitudinal, as one would expect from the enormous transverse dilatation of the cervix which arises. But it also is sometimes circular. I have said that the tear almost always—if not always—affects the cervical segment of the uterus. That statement I made advisedly, because, as I have elsewhere affirmed, I believe that spontaneous rupture of the healthy body and fundus is an impossibility. Whenever, therefore, as in one of Dr Lee's cases, the body is found torn in a case of this accident, there is, I think, reason to assume that some unhealthy predisposing cause has been pre-existent in the uterus.

But leaving the mechanism of rupture, let me make a few observations, in concluding, as to treatment.

I assume that the medical man in charge has made out a correct diagnosis of the case, and has satisfied himself that the natural powers are unable, without at least unduly risking the mother's life, to complete delivery. What is then to be done? In some cases Nature is found to solve the problem, and take the lead in treatment by herself, bursting the fluid bag within the cranium, and forcing it, or a portion of it, along the spinal canal, or under the skin of the fœtus, so as sufficiently to lessen the size of the head and effect delivery. This cannot but suggest puncturing the head as a means of delivery. But is this always needed? Is there no other alternative? There is no doubt but early interference on the part of the obstetrician, so as to effect delivery with safety to the mother, is of the highest importance, inasmuch as so few children with hydrocephalus are born alive, or can live. Thus, of sixty cases referred to by F. Weber, forty-one died during labour, and only six lived for a year. Still it is our duty, so far as possible consistently with the complete safety of the mother, to try to save the child also. Therefore, if it is a slight case, one ought to carefully watch the course of delivery, noticing especially the degree of upward advance of the upper edge of the cervix, and if the resulting tension of the latter is not too great, the case ought to be left to nature for a time. But if it is seen that nature is insufficient, or if the upward advance of the superior edge of the distended cervix is indicative of a dangerous amount of cervical distension, the pains being at the same time severe, then we must interfere in order to hasten delivery.

As to whether forceps should be employed in the first instance, opinions are divided. The French authorities seem favourable to them, the Germans against them, whilst the English authors say little on the subject. The risks arising from forceps are chiefly slipping, as they cannot firmly grasp the soft elastic head, and the aggravation they are apt to produce of this already highly established tendency to rupture. On the whole, however, it appears to me that there can be little harm from a careful application of the instrument before proceeding to the extreme measure of puncturing the head.

If the head is very high up, turning might be tried, as the after-coming head presents at the inlet under specially advantageous circumstances, whilst puncturing is easily effected through the foramen magnum, or otherwise. F. Weber practised in two of his cases the application of forceps during the pains without tension, and merely with the view of elongating and moulding the head into the passage. Both were unsuccessful, and the proceeding seems an exceedingly doubtful one. But there is no doubt that most of these cases require and are best treated by puncturing. A small-sized trocar and canula is quite sufficient, and is recommended by Schroeder, in case it may be possible to rear the child—a very improbable contingency. Then, if there is no abnormal pelvic resistance and a fair amount of uterine contraction, the natural expulsive powers may suffice to expel the head. If not, various means may be adopted to assist. The forceps may be sufficient, even by its imperfect traction power, as in the present case. The cranioclast or a light cephalotribe may be fixed in it, and the means of traction thereby effected. Or, if it is considered important to avoid injuring the child in any way, we may follow the advice of Schroeder, and, after lessening the size of head by puncturing, turn and deliver by the breech.

In those cases in which the head is both large and well ossified, the appropriate treatment is to perforate and reduce the size of the skull, as in an ordinary case of craniotomy for deformed pelvis.

When the breech comes first, endeavours ought to be made to pull the head through without the application of undue force; and if that is impracticable, then puncturing the head, either through a suture or by the foramen magnum, or by cutting down the spinal canal between two spinous processes, and if necessary, as Spiegelberg advises, passing a tube along the canal to the foramen, and thus drawing away the fluid.

ARTICLE III.—*Refracture for the Relief of Deformity following Badly-treated Fracture of the Extremities.* Illustrated by Cases Treated in the Pennsylvania Hospital. By JOHN B. ROBERTS, M.D., of Philadelphia, United States.

(Concluded from page 13.)

CASE VI.—*Refracture of Callus in a Case of Badly-united Fracture of the Femur. Cure, with great Reduction of the Deformity and Shortening.*

DANIEL G., a sailor, aged 17 years, fell from aloft, sustaining a fracture of right femur and a double fracture of both bones of the right forearm. The mate of the vessel rudely bound some splints to the limb, but used no means to keep up extension on the thigh. Moreover, the boy became delirious and tore the dressings from his leg, so that there resulted great deformity from overlapping and mal-position of the fragments, caused by the upper fragment being tilted upwards and rotated outwards. When admitted to Dr Levis's ward, there was three and a half inches shortening, external angular deformity, and a large amount of irregular callus. At first an attempt was made to overcome the shortening by extension, obtained by the traction of a heavy weight, applied according to Buck's method of treating fractures of the femur, but this was unavailing, as the union was too firm. Finally, after more than six weeks from the receipt of the original injury, a splint was bound along the leg and thigh as far up as the deformed union, in order to make the knee rigid and to give a powerful leverage at the seat where the rupture was desired. The knee of the operator was placed as a fulcrum on the most salient point of the deformity, and the callus was broken by leverage of the limb and splint. Extension was then made by manual force, and afterwards continued by a weight of ten pounds applied by adhesive strips in the ordinary manner. The amount of shortening was thus reduced to ¾ of an inch, and the angular deformity greatly overcome. One month and twelve days afterwards the extension was removed and a pasteboard splint applied, subsequent to which the boy was allowed to get up and walk with crutches. After the lapse of a little over eight weeks from the time of operation, the patient was discharged cured, with about one half-inch shortening.

CASE VII.—*Fracture of the Femur resulting in Deformity with 2¾ inches Shortening. Forcible Rupture of the United Bone, after a lapse of six months and three weeks, followed by Cure without Deformity.*

Bridget Q., aged 19 years, fell from a swing on the 26th of September 1876, fracturing the left femur at the middle third. She says she was kept in bed nine weeks, but when allowed to get up there was great deformity at the seat of injury. When Dr Levis admitted her to the Pennsylvania Hospital, there was found to be great overlapping of the fragments, and a shortening of 2¾ inches. There was a large mass of callus at the seat of injury, and it was difficult to decide whether there was any motion between the two fragments, because a sense of mobility was given by the play of the head of the bone in the acetabulum. It was believed, however, after careful examination, that there was perfect consolidation, and not a sliding motion between the two broad surfaces of partially connected callus. The woman could walk without the aid of crutch or cane, but the body went down in a very ungainly manner when she threw the weight of the trunk on the shortened limb. The patient was etherized thoroughly on 18th April 1877, and a broad sheet, passed around the left groin, was attached to a staple in the wall beyond the head of the operating table. A sort of a clove hitch knot was then made around the lower part of the thigh with another sheet, to which was attached a set of pulleys fastened to a staple below the foot of the table. Very powerful extension was then made by an assistant pulling forcibly on the rope passing around the compound pulleys. When an extreme amount of tension was thus brought upon the crooked femur, Dr Levis threw his weight upon the convexity of the arch, and thus caused the osseous tissue to part with a loud snap. The amount of extending power obtained can be realized when it is remembered that, with a compound pulley with four wheels, such as was used, the power is increased eightfold; minus, of course, the friction. If the assistant, therefore, exerted a force of only fifty pounds, and there was no friction, the extending force would be represented by four hundred pounds.

After the operation the limbs were again measured, and the shortening was found to be reduced to about one quarter of an inch. A weight of twenty-two pounds was applied as a permanent extension by adhesive strips and a series of straps and buckles; and subsequently a sand-bag placed along the outside of the thigh, and another short one laid over the seat of fracture to prevent tilting upwards of the upper fragments. A sheet was passed around the groin to keep up counter extension. This caused slight redness and pain, which were happily relieved by a compress of lint. On 30th April the notes of Dr M. F. Kirkbride say that there was only about one quarter inch shortening, and that there was no overlapping. The extending weight was reduced on 22d May to ten pounds, and the sand-bags were removed; at this time but little union had occurred. By the time another week had elapsed there was much firmer consolidation, and eight pounds were deemed sufficient to maintain extension. After about one week more a pasteboard splint was adjusted from below the knee up to the hip, and the patient permitted to leave her bed. From this time improvement was steady, and she was discharged, after laying aside the splints and crutches, to go to the country, still having, however, some stiffness of the knee from the protracted immobility of the joint during the treatment. This, no doubt, would only be temporary.

CASE VIII.—*Deformity resulting from Unsuccessful Treatment of Fracture of the Radius and Ulna. Union broken up by Manipulation. Improvement.*

A schoolboy, 12 years of age, broke both bones of the right forearm about two months before being admitted to Dr Levis's ward. It had been treated by splints, it was said, but apparently not very successfully, for there was great deformity at the seat of injury. The radius and ulna had been fractured near the middle; and, though the boy had perfect flexion of the joints and good rotation, there was marked bowing outwards of the bones towards the ulnar side. The bones were refractured, and the arm placed in a Bond's splint, with the requisite compresses. This dressing was used rather than two straight splints, as it seemed to keep the fragments in good position. On 10th November 1876, two days after the operation, it was noted that there was no pain or swelling. Lest there might occur obstruction to rotation by callus in the inter-osseous space, the limb was dressed a few days later with an anterior and a posterior splint, and kept in a position midway between pronation and supination. Subsequently there was noticed a tendency to reproduction of the old deformity, and a compress, which was soon replaced by a narrow third splint, was applied along the ulnar margin of the arm. On 7th December the splints were discontinued. The deformity was still considerable, but not so marked as before the operation.

These methods of operating were strictly subcutaneous procedures, but there are other methods which are subcutaneous in the ordinary acceptation of the meaning of subcutaneous surgery, though not really such. One of these is to perforate the bond of union with the drill to weaken the callus, and then to rupture. A representative instance of this operation is afforded by the following case, occurring in the Pennsylvania Hospital:—

CASE IX.—*Refracture of the Bones of the Leg by Perforation with the Drill and Tenotomy for the Cure of Faulty Union.*

This case was reported by Dr Hunt several years ago, but the greatness of the deformity and the success of the complicated operation rendered it one of special interest in this connexion. J. H., a sailor by profession, and 37 years old, was admitted 19th February 1872, with such deformity of the left leg that he could scarcely walk. In the summer of 1871 he had fallen from the rigging and fractured both bones of the leg near the middle. He remained on shipboard nearly three weeks, when he was transferred to a hospital at Liverpool, where he remained for several months. Examination showed remarkably firm bony union with great angular deformity, and the foot in the position of such marked equino-varus that the sole presented towards the opposite side. There was also a cicatrix over the hip-joint of the same side, which was somewhat anchylosed, from an injury received at the time his leg was broken. After he had been in the hospital some little time a large drill was introduced through a small incision, and the bone bored completely through in three or four different directions, though there was but a single external wound. The surgeon then applied sufficient force to produce rupture at the old point of fracture, which produced a report like the discharge of a pistol. The next steps were the division of the tendo-Achillis and the breaking up of the adhesions about the hip-joint. The leg was then put in a good position and showed very little shortening. The dressing was as follows:—"A stout pasteboard splint, well fitted to the external aspect of the foot and leg, was applied, a moderate degree of extension by adhesive strips was maintained, and strips also were used to keep the foot in a position of slight eversion. The extension was abandoned after a short time as not requisite, and the limb, with the other dressing complete, was placed in a fracture-box."[1] Slight suppuration followed, and several small pieces of bone were removed from the wound. Subsequently the patient was seized with an attack of what seemed to be hepatitis and pleurisy, and at the same time an ugly deep slough occurred at the wound over the fracture. At this time it seemed as though the man would die. There were grounds for suspecting a syphilitic taint, and he was therefore given iodide of potassium and the corrosive chloride of mercury. The result, however, was unexceptionally good, for when the slough separated,

[1] *Philadelphia Medical Times*, 23d October 1872.

it was found that the progress of union had not been interfered with. On 1st August the patient was able to walk—could bring the foot flat to the ground, and could perform all the natural movements of the limb. The union was solid, the tendo-Achillis repaired, and the movements of the hip restored. On 1st October he was seen, and exhibited a slight limp in his gait, which was possibly due to the shortening; that, however, amounted only to one-quarter of an inch. This patient was seen in good health during the past winter 1877–78.

Brainard, in 1853, proposed introducing a drill and perforating the callus in various directions subcutaneously, then allowing inflammatory softening to occur; and finally, after a lapse of some time, say ten days, restoring the crooked limb to its normal condition by force. His case was very successful, and may be condensed as follows:—A boy, aged 3 years, had sustained a fracture of the tibia and fibula, two years and nine months previously, which had left great angular deformity and shortening of three inches. Perforation was done, and force applied ineffectually to refracture; the case was left ten days, and a further attempt at straightening was successful, though only a moderate degree of force was employed. The cure was very satisfactory, and the patient was enabled to walk.[1] A similar operation was performed by Dr Stephen Smith, in 1860, upon a boy who had deformity, resulting from a partial fracture that had not been straightened.[2] Suppuration occurred in one of the two punctures made in the skin, but the distortion was improved. Nussbaum has proposed to cut through three-quarters of the bone with a chisel, allowing the external wound to heal, and then to fracture the remaining fibres. This method does not leave sawdust or chips, as does the method which uses the perforator or saw.[3]

Dr Frederick D. Lentz, of New York, has suggested that the surgeon may accomplish the object by using a drill of very small size for perforating the centre of the callus through a mere cutaneous puncture, and following this with an instrument, which he calls a subcutaneous saw, consisting of a narrow blade with a rounded point and saw teeth upon it for an inch from the end. This, being smaller than the drill, can be worked backwards and forwards inside the mass of callus, and thus weaken it in any direction.[4] He had not employed this operation at the time the article was written. This class of operations, I think, is objectionable, because, though to a certain extent subcutaneous, they are not absolutely so, and are very liable to occasion suppuration, as in Smith's and Hunt's cases mentioned, and to behave as compound fractures. While they should not be discarded, and are certainly better than cutting down and excising a portion of bone, they are much more serious than refracture by external means alone, which I believe can be accomplished in almost, nay, I think I may say, in every instance, if the force be applied in a proper mechanical way.

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[1] *American Jour. Med. Science*, 1859, vol. xxxvii. p. 577.

[2] *American Med. Times*. New York, 1860. Vol. i. p. 310.

[3] *Dublin Journal of Medical Science*, October 1875.

[4] *New York Med. Record*, vol. ii. 1867, p. 101.

Objections to the Operation.—What are the objections urged against refracture as a means of relieving deformity from malunion, and what are the dangers that may be encountered? The first objection to be suggested to any one would be the possibility of the bone giving way at a point more or less distant from the original fracture. This, however, is to be considered almost impossible, unless the bone be diseased and softened. It is a very different condition of things from that where strong efforts employed for the rupturing of an anchylosed joint are followed by fracture of the shaft of the bone. In the latter case, we have two large expanded articular surfaces firmly bound together by adhesions, which have probably been deposited by a chronic inflammation, that has at the same time caused more or less disintegration of the neighbouring bone. In the case under discussion, there are two overlapping fragments much smaller as a rule than the articular ends, and generally united at an angle by fibro-osseous matter. This must be much weaker than the normal bone above or below, even if a large amount of irregular callus has been thrown out around the seat of fracture. In fact, to one who has not made the experiment, it will be surprising to find how much force is required to break even so small a bone as the radius across the knee, when the bone has been divested of all the tissues and dried. Much more strength is requisite to fracture one of the bones of the extremities when it is surrounded by periosteum and buried in the muscular masses surrounding it. In order to test this matter I made some experiments on the cadaver where there had been no fracture. I drew the leg of the subject over the end of a table, and while an assistant steadied the thigh and knee as well as he could, endeavoured to fracture the tibia by the manipulations that would be employed in refracturing a deformed union of the leg. I repeatedly threw all my weight, over 150 pounds, with sudden force upon the leg, but only succeeded in fracturing the fragile fibula, which being posterior and superficial, was brought in direct contact with the edge of the table without any muscular cushion. My assistant, who was stronger than I, failed also in his attempts to break the tibia. The only method that would avail to cause fracture of the tibia, was to turn the subject on its face, in order to bring the subcutaneous surface of the tibia downwards, then by suddenly striking this portion of the bone powerful blows on the sharp edge of the *iron* table, I succeeded in producing an oblique fracture at the lower part of the middle third. These experiments show what a tremendous force would be required to fracture a sound bone by the manipulations used for refracturing deformed callus; for in that operation no one would ever think of selecting a sharp iron edge on which to strike the subcutaneous surface of the tibia. My efforts fully convinced me that there was no possible chance of my succeeding in fracturing the femur, buried as it is in a large mass of muscles. The radius and ulna were only broken by the same kind of sudden blow over the sharp table edge. It is a long time before the permanent callus becomes as firm and compact as the original bone, as is shown by the fact that, after once sustaining a fracture, the patient in falling is exceedingly liable to refracture at the seat of original injury. A rather remarkable case bearing on this subject came under my notice a few weeks ago. The boy, who was 18 years old, had a distorted forearm resulting from fracture about 4½ inches below the point of the olecranon. His history was as follows:—When eight years of age, he fell out of a tree and sustained a fracture of left forearm near the elbow. One year later he fell down stairs and broke it again in the same region, but says he thinks only one bone (?) was broken at that time. Three years subsequently, or when he was about twelve years of age, he fell into the hold of a boat, and sustained a third fracture, but does not know whether both bones were broken or not After this, he thinks the arm was as straight as the other, and straighter than it had been *previous to this third accident;* but there was some impairment of rotating power. Eight or nine weeks before these notes were taken, or nearly six years from the time of the third fracture, he fell from a coal-waggon, which, however, was not in motion, and sustained a fourth fracture, which from the present appearances must have involved both bones. Here then is a case where refracture occurred in the same position, as near as may be, four successive times at intervals of one, three, and six years, due evidently to the natural weakness of the bond of union, for the fractures resulted from injuries that would probably have been productive of other fractures if there had been any constitutional predisposition to fracture in the patient's skeleton; moreover, they occurred in a young person when solidification is supposed to occur rapidly. This liability to fracture at the original lesion has been repeatedly noticed, and is said to be equally true in animals.[1]

The period required to give the bond of union the solidity of original bones—if indeed that ever occurs—must therefore be looked upon as indefinitely long. Suppose, however, it were possible to have the bone give way above or below the seat of deformity, would it not give the surgeon an opportunity of making a compensatory cure that would be advantageous to the patient?

The objection to refracture, advanced by some, that erysipelas, abscess, necrosis, or pyæmia, may result, can be dismissed in a few words. Every one knows the extreme unfrequency of these occurrences in non-complicated simple fractures. The original injury has, in nearly all these cases, been attended with more disturbance of the tissues than is caused by the operation of refracture. When the patient is in good condition, the bones have rounded ends, and never lacerate, and the fracture is dressed without suffering the jarring and jolting of transportation. From the cases that I am cognizant of, I am inclined to believe that inflammation of a character sufficient to cause swelling and tension of the parts is exceedingly rare. I have mentioned above, when speaking of the time after injury that refracture may be attempted, the case of Dr Walker, where his strong, though unsuccessful, efforts were followed by so little inflammation that the patient was up on the following day. Skey has reported a similar case.

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[1] *Holmes' System of Surgery*, vol. ii. p. 96.

There seems also to be no real danger of rupturing vessels that have become shortened by reason of the decreased length of the limb. A much more important topic remains. Is there not danger of non-union after refracturing a firmly united bone? Though we must admit the possibility of such an event, since Dr Whitridge had reported[1] an instance subsequent to refracture of the radius and ulna, I believe it to be about as unlikely as non-union of the soft parts after incision through an old cicatrix, provided, of course, that the fracture received proper treatment. Velpeau states that these new fractures consolidate as a rule more readily and easily than the primitive fractures. This may depend on the fact that there is required much less repair of muscular tissue and less absorption of blood, which processes are preparatory steps in the union of fractures of an ordinary variety. Oesterlen gives seventeen cases of rupture, and in no case did union fail to occur.[2] Moreover, ununited fracture, unless there be constitutional reasons, is rare in any event except as the result of imperfect treatment, which has allowed mobility of the fragments, or of the presence of portions of tendon or muscle between the ends of the bone. These factors are eliminated in the case under discussion, where you have selected a favourable time as to the health of the patient, have dressed the limb with appropriate apparatus, and where there is little or no opportunity for tissue to become entangled between the ends of the bone. The great unfrequency of non-union in well-treated fractures is shown by the statistics of Norris.[3] The number of fractures of all bones treated in the Pennsylvania Hospital from 1830-1850 was 2190, among which there occurred, says Norris, no instance of artificial joint. The only cases of ununited fracture observed during that period were those sent to the hospital from distant parts. Of course some of these 2190 patients died, and some were removed by friends (about 400 altogether), and it is impossible to say what would have been the result if they had remained; one or two, perhaps, might have been examples of ununited fractures. Again, in Bellevue Hospital, New York, from 1865 to 1873 inclusive, there were 128 fractures of the shaft and condyles of the femur, of which the result was known, and in this number there occurred only two examples of non-union.[1]

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[1] *New England Medical Review and Journal*, vol. i. 1827. Quoted by Norris in *Contributions to Practical Surgery*.

[2] Norris, *loc. cit.*

[3] *Op. citat.*, p. 143.

Malgaigne tells us that Lonsdale saw only five or six instances of non-union among nearly 4000 cases of fractures treated at the Middlesex Hospital.[2] These statistics, though I always distrust statistics, give an idea of the comparative unfrequency of deficiency of union after fractures. The persistency with which union occurs is well shown in the boy reported above, who sustained four fractures of the forearm, and yet, when seen eight or nine weeks after the last fracture, had firm union. He would have been subjected to refracture by Dr Levis, for relief of the deformity and pain resulting from last fracture, had he not become dissatisfied and left the hospital. I have looked carefully over a large number of journals and systematic works on surgery without finding any case reported where a false joint followed refracture, except that of Whitridge already mentioned.

Norris states[3] that Sir William Fergusson once amputated a limb for ununited fracture of the femur occurring after the bone had been rebroken on account of mal-position. This is probably a mistake, for I have referred to the original report of the case as cited by Norris, and find that the amputation was done for an ununited fracture, but the cause of the non-union is not given as resulting from refracture.[4] It must be recollected in this connexion, I admit, that we are unfortunately apt to neglect reporting bad results following important operations, hence other instances of non-union may have occurred. As having some bearing on this part of the subject I may refer to Case IV., where both the femur and the humerus were refractured at the same time, and union took place in six and a half weeks without difficulty. Again, it will be observed, that in Case III. the patient had originally fractured both humeri as well as the leg, and yet, though the leg was rebroken after the lapse of six weeks, union occurred in six and a half weeks without any trouble. A similar instance is recorded in Case VI., where the boy had the radius and ulna of one arm broken in two places at the time of the fracture of the femur. Union occurred at all the fractures, and after refracture of the femur it united readily a second time in eight weeks. These facts are mentioned to show that there seems to be no narrow limit to the capability of the healthy system furnishing callus for the consolidation of multiple or repeated fractures.

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[1] Frederick E. Hyde, *New York Medical Record*, 1875, vol. x. p. 513.

[2] *On Fractures*, translated by Packard, p. 120.

[3] *Contributions to Practical Surgery*, p. 131.

[4] *Lancet*, vol. ii. 1850, p. 653.

Death may undoubtedly follow this, as indeed it may the most trivial operations, and Haly Abbas, Morgagni, and Laugier have each recorded such a result. The repeated allusion to these same cases, however, in the text-books, shows how unfrequent the occurrence must be.

The After Treatment.—The after treatment of cases of refracture is sufficiently plain. In some instances it may be well to keep up great extension with the pulleys for an hour or so after refracture has been accomplished, in order to fully stretch the parts, and exert a certain paralyzing influence upon the muscles which tend to displace the fragments. The most successful treatment will probably be some form of extension combined with well-directed pressure of splints and pads over the situation of the angular displacement. The extension method is of course applicable in refracture for deformity of the upper as well as the lower extremity, though not so frequently required. The extending weight should be sufficient to do the work, and if adhesive plaster-slips will not bear the strain, it may be reinforced by the application of some apparatus made of straps and buckles, as in Case VII. If the fracture is low down near the ankle, it may be necessary to use a footboard, strapped to the sole of the foot, in order to get attachment for the extending weight. The necessity of employing splints of wood, pasteboard, or felt at the seat of fracture is obvious, since the extension merely obviates over-riding, without keeping the fragments at rest or preventing angular or rotatory deviation.

In occasional instances tenotomy may be required to assist in preventing displacement, and this is not to be deprecated, for it does not add much to the severity of the operation, since the tendon cut is generally at a distance from the fracture, and hence the puncture does not make the fracture compound.

Results.—The most important consideration is yet to be discussed; namely, the results of refracture as to the relief of deformity, and in regard to the usefulness of the limb afterwards. In this paper I have endeavoured to collect all the cases that have occurred in the Pennsylvania Hospital from January 1873 to December 1877, excluding, of course, those which were treated by excision or drilling, because they were subject to different conditions, from the fact that more or less air had access to the seat of fracture. It was my intention to collect a much larger number of cases from the periodical literature of the last twenty-five years. After looking over many pages of journals and text-books I obtained some thirty additional cases occurring in America; I found, however, that no reliable deductions could be drawn from these, because of the well-known fact that practitioners are loath to report unsuccessful operations, and because, on the other hand, many cases were only partially reported, and dozens, doubtless, were never recorded at all, owing to the supposed unimportance of one or two operations of this kind.

Operator.	Date.	Sex and Age.	Time after original fracture.	Bones refractured, and situation.	Deformity before the operation.	Result.	Time of Treatment.	Remarks.	Number of the Case as reported.
R. J. Levis.	1876	M., 12	10 weeks.	R. and U., at middle.	Angularity.	Improved.	4 weeks.	No inflammatory symptoms.	Case VIII.
A. Hewson.	1874	M., 15	3½ weeks.	H., at middle.	Much deformity.	Some overlapping.	6½ weeks.	No mention of inflammatory symptoms. Refractured femur at same time.	Case IV.
T. G. Morton.	1873	M., 26	6 weeks.	T. and F., upper third.	Angularity.	Good position.	6½ weeks.	No mention of inflammatory symptoms. Had both humeri broken when leg was first fractured.	Case III.
R. J. Levis.	1875	F., 13	5 weeks.	T. and F., at ankle.	Foot displaced outwards.	Scarcely any deformity.	5 weeks.	No inflammatory symptoms.	Case I.
T. G. Morton.	1877	M., 37	15 weeks.	T. and F., lower third.	Foot displaced inwards.	No appreciable deformity.	5½ weeks.	No inflammatory symptoms.	Case II.
R. J. Levis.	1873	M., 17	6 weeks.	F., upper third.	Angularity, shortening, 3½ in.	Shortening, ½ in.	6½ weeks.	No mention of inflammatory symptoms. Had double fracture of one forearm when femur was first fractured.	Case VI.
A. Hewson.	1874	M., 15	3½ weeks.	F., middle.	Shortening, 1¼ in.	Shortening, ½ in.	6½ weeks.	No mention of inflammatory symptoms. Refractured humerus at same time.	Case IV.
Wm. Hunt.	1875	M., 17	6 weeks (?).	F., above condyles.	Shortening, 1½ in.	No deformity, no shortening.	9 weeks.	No inflammatory symptoms.	Case V.
R. J. Levis.	1876	F., 19	29 weeks.	F., middle third.	Angularity, shortening, 2¾ in.	Shortening, ¼ in.	10 weeks.	No inflammatory symptoms.	Case VII.

A glance at the schedule will show that during the time mentioned eight patients were treated in the hospital by refracture; the number of operations, however, was nine, because one patient had both an upper and a lower extremity operated on at the same time for deformity, resulting from mal-union. In all the cases except one (Case VIII.) there was very marked amelioration of deformity, and, as far as relief from lameness, etc., is concerned, we may consider the patients cured. This is very noticeable in the refractures of the femur, because we have the amount of shortening before and after treatment recorded. In the four cases it was reduced to ½ inch, ½ inch, none at all, and ¼ inch respectively; while before treatment there was 3½, 1¼, 1½, 2¾ inches. Another feature is the non-occurrence of marked inflammation after the violent manipulations necessary to effect rupture. In the hospital notes I find no mention of any such occurrence in any case of the whole number, and reference to the fact would hardly have been omitted in the running notes of the patients if it had occurred to any extent. The time of treatment after refracture will be found to be about the same as usually required for the uniting of ordinary fractures in similar situations. I have calculated the time by counting the number of weeks between the day of operation and the day on which the splints were discarded and the union found to be firm, though in cases of fractures of the lower extremity the patient was required to sustain a portion of his weight on crutches or canes for some time longer as a precautionary measure. This, of course, would vary much with different surgeons and attendants, and has therefore been left out of the calculation.

The lessons taught by an examination of these cases may be formulated as follows:—

Refracture is the best method of correcting deformity after maltreated fractures, because it gives relief without suppuration, which is liable to follow drilling, and almost certain to result from the operation of excision.

It may be undertaken whenever there is a possibility of overcoming the causes that gave rise to the deformity after the original fracture.

The time is only limited by the ability of the surgeon to rupture the bond of union.

Refracture is accomplished by bending, either alone or combined with powerful extension.

If the bone be healthy, there is no danger of fracturing in any situation but that of the original lesion.

The occurrence of erysipelas, abscess, necrosis, and pyæmia is too rare to be considered an objection to the operation.

Non-union almost never occurs.

The results as to correction of deformity and as to usefulness are uniformly satisfactory.

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N.B.—This bibliography must be regarded by the reader as but a partial list of the articles written on the subject, for of late years the operation has become quite common, and many single cases have been reported. Unfortunately, I have been unable to verify all the references given.

ARTICLE IV.—*Some Account of a Disease called "Shima-Mushi," or "Island-Insect Disease," by the Natives of Japan; peculiar, it is believed, to that country, and hitherto not described.* By THEOBALD A. PALM, M.B. and C.M.

THE following interesting notice occurs in a recent letter from Dr Palm, who is a medical missionary at Niigata, in Japan, to the Rev. John Lowe, F.R.C.S.E., Superintendent of the Edinburgh Medical Missionary Training Institution. Some cases of interest are related in the same communication, but our space forbids us from publishing them at present. We may mention, however, that out of 1263 cases treated by Dr Palm, 288 were eye diseases, and 193 syphilitic; that he sees the latter class of diseases in all their forms and results, and that he is told that there is scarcely a man in Niigata who has not at some time suffered from some form of venereal disease.

"Last summer," writes Dr Palm, "I had the opportunity of observing a disease which, so far as I know, is peculiar to Japan, and has not yet been described. It occurs, moreover, in certain well-marked districts, and at a particular season of the year, so that the opportunities of investigating it do not often occur. It is known here as the *shima-mushi*, or island-insect disease, and is so named from the belief that it is caused by the bite or sting of some insect peculiar to certain islands in the river known as the Shinagawa, which empties itself into the sea at Niigata. This river has a strong current, is subject to occasional floods, and being difficult to restrain, is allowed to take its course, eating out its banks on one side, and leaving tracts of new land or islands on the other. It is in these newly-formed soils that the disease occurs. I could find nothing peculiar in the vegetation of these districts.

They are partially under cultivation, and the disease occurs among the agricultural labourers who work there, or others who may happen to visit the district at the time. Those are attacked who go among the vegetation, not those who walk along the stony or gravelly banks. The disease occurs only in the months of July and August, especially at the time when the flax-plant, which is there much cultivated, is being reaped, and especially among the reapers. The disease is said to be more prevalent in years when the water has been high. It is also said that those who work there only in the early morning or evening are not affected. It is also said that those who are stripped for their work are less frequently affected than those who keep on their clothing. The remarkable thing is, that none of those who are affected are aware at the time of being bitten or stung, and that none of them have ever seen the insect; but the belief universally prevails that it is an insect. At the time of my visit to the spot on 1st August, I could find no one who had seen the insect, though I was told of one man who professed to have seen it, and stated that it was like a small spider. The peasants believe that it is a fine, hair-like worm, of which there are two varieties, the red and the white; but I was unable to discover any foundation for the belief.

"The first symptom of the disease is a hard, round swelling of the skin, like a boil, which is discovered four or five days after having been in the district. Together with this are constitutional disturbance, chills, and feverishness, and swelling and tenderness of the glands in the neighbourhood of the swollen part. The centre of the swelling sloughs and breaks down into an ulcer. Sometimes the tenderness and swelling of the glands is noticed before the phlegmon in the skin appears. Sometimes, for a day or two before the swelling is noticed, there is languor, malaise, headache, loss of appetite, and slight feverishness. The fever reaches a maximum at the beginning of the second week, when an eruption appears over the whole body in most cases, after which the fever subsides. Most cases have purging of blood and vomiting, and death occurs by exhaustion in three or four weeks from the first symptoms, in fatal cases. It is said that the disease proves fatal in about one-fifth of those attacked. Delirium does not occur, nor are there any symptoms of narcotism even in the worst cases; albumen does not appear in the urine.

"For the above facts I was indebted to native medical men, intelligent men, with a fair knowledge of European medicine. I am in the habit of visiting the government hospital at Nagaoka, of which my informants are the medical officers. I was curious and sceptical about the disease, and expressed a wish to see it. Accordingly, when visiting the hospital on 1st August, I was taken to the district, about two miles from Nagaoka, where I found that a Buddhist temple had been appropriated as a temporary hospital for the reception of patients affected by the disease, and that an intelligent young man, a student from the medical school in Tokio, conducted by German professors, had been appointed as house-surgeon. It appeared, however, that the peasants had an aversion to Western medicine, and that it was very difficult to induce them to come into hospital. I took the following hasty notes of the cases in the hospital:—

"No. 1.—A man having a hectic appearance; temp. 102°·4, pulse 104; has an ulcer on scrotum size of a threepenny-piece, which commenced as a solid elevation, and gradually broke down into an ulcer; no induration around it. Skin has here and there purplish maculæ, and some papules. Tongue dry and glazed in front, yellow fur at the base; bowels regular; liver of normal size. Heart is weak. Spleen not enlarged. Breathing shallow and 51 per minute, but on percussion and auscultation the only abnormal sign is that breathing is rather harsh in character. The patient appears to be in a very exhausted condition, and seems excited and frightened at being examined by a foreigner. Intellect is clear.

"No. 2.—Lad æt. 17. The fourteenth day of the disease. The primary sore is at the verge of the anus, where there is a sharply-cut oval ulcer, ¼ inch long and about ⅛ inch deep. He was brought to hospital on 28th July, when at noon his temperature was 105°, and he was too ill to move. The sore was discovered on the 19th, and the inguinal glands became swollen at the same time. He has an eruption, which on the face is papular and desquamating; on the trunk and limbs is macular. It appeared two days ago. Now his pulse is 100, full and strong, temperature 99° in the forenoon. Tongue red and moist in front, has yellow fur towards base, appetite is about one-third of his normal; bowels have not been moved for nine days. Has slight cough, otherwise lungs are normal. Heart normal. Spleen not enlarged. Liver slightly enlarged. Urine dark in colour, otherwise normal. Talks incoherently. Face not flushed, but conjunctivæ injected; pupils slightly contracted. Glands not markedly enlarged.

"No. 3.—A strong man, æt. 31. Tenth day of disease. Has an ulcer the size of a threepenny-piece on inner side of thigh, sloughy surface, no induration around edges. It began as a papule six days ago with a red areola, and ulcerated into its present condition. Has an eruption, which appeared two days ago, of maculæ on trunk and legs, and 2 papules on face. Tongue white, fur at fore part, yellow behind, and red raised papillæ at edges; sordes on lips; appetite one-third of normal; bowels regular. Heart sounds are normal; pulse 76. Has cough; slight signs of bronchitis on left side. Liver somewhat enlarged. Splenic area of dulness somewhat increased. Glands in right groin are markedly enlarged. In other places glands can be felt, but not more distinctly than in many healthy persons.

"No. 4.—Male, æt. 35. Fourteenth day of disease; has sore on penis of same character as those described above. An eruption came out six days ago, but disappeared and left no trace. He has now no constitutional symptoms, and appears to be quite well, with the exception of the sore.

"No. 5.—Female, æt. 15. Fifth day of disease. Has an inflamed spot like a small boil on right side over ninth rib; the glands in right inguinal region are tender and enlarged. The left inguinal glands are also enlarged, but apparently due to an injury of left foot. Temp. 98°·5; pulse 60; temp. last evening was 100°. No eruption yet. Lungs and heart sound. Spleen not enlarged, and otherwise well.

"No. 6.—Male, æt. 18. Seventh day of disease. In right iliac region a hard round swelling, size of a threepenny-piece, with a black clay spot in centre. Over trunk, limbs, and face are raised purplish spots, which appeared two days ago. Axillary glands enlarged. Pulse 120; temp. 103°·9. Tongue red and moist at edges, black fur in centre. No appetite. Other organs seem normal.

"I saw one man who had recovered completely. The disease appeared to leave no sequelæ. After seeing the cases in hospital, I went out into the neighbouring village, and under the guidance of the head man of the place, visited several cottages where persons affected were lying. They were most of them in such darkness and dirt as to make the examination of them very unsatisfactory. They all had the appearance of persons prostrated by a severe fever, and all had the primary sore.

"The disease appears to me to be specially interesting from a pathological point of view in the analogy it presents to syphilis: the primary sore caused apparently by inoculation with an animal poison, the period of incubation short, the secondary eruption and fever, affection of glands. In fact, the disease is a link pathologically between syphilis and the eruptive fevers, and is interesting in connexion with Mr Hutchinson's view of syphilis as an eruptive fever having a protracted course.

"As to treatment, various drugs have been tried, including iodide of potash, but none seem to have any marked effect. Treatment directed against hyperpyrexia and other untoward symptoms that may arise, attention to hygienic conditions—in fact, such measures as would be taken to steer a patient safely through a continued fever, seem to have met with the best success. I learned by subsequent inquiry that all the patients of whom notes have been given made a complete recovery.

"As to the etiology of the disease, I was inclined to agree with the popular belief that it was caused by the bite or sting of an insect, and some probability was lent to this by the fact that the sores were situated in parts of the body loosely covered by clothing. Thus the men whom I saw were all affected in the parts that would be covered by the loin-cloth, which would be their sole article of clothing while working in the fields.

"Later on in the month of August, the house-surgeon, abovementioned, called on me and stated that he had discovered the insect, that while picking with a needle the black spot in the centre of the swelling of a patient recently affected, he noticed crawling up his finger, a very minute insect, which, upon microscopic examination, resembled a spider. To preserve his specimen he had stuck it with gum between two glass slides, and offered it to me for examination. His method of preserving it, however, had rendered it impossible to do more than recognise that it was an insect of some kind, but it may have been an *Acarus scabiei*. Under the circumstances, I do not consider it yet demonstrated that it is caused by an insect.

"I propose, however, next summer, acting upon this supposition, to try an external application of some preparation of cevadilla as an insecticide and prophylactic, if I can induce the labourers to make a daily use of it while working in the district.

"I should like to know whether anything similar has been observed in other countries, and what are the symptoms caused by the bite of certain poisonous spiders."

ARTICLE V.—*Note on the Physiology of Respiration.* By T. M. LOWNDS, M.D., Egham Hill, Surrey.

THERE is one point in the physiology of respiration to which it seems to me attention has not been drawn. It is generally stated that the venous blood gives off its carbonic acid into the air-cells by virtue of the laws which govern the inter-diffusion of gases through a moist membrane. This is undoubtedly true, but it does not proceed far enough and take into account all the circumstances which exist in the air-cells of the lungs where these interchanges of gases take place. The circumstances to which I allude are the varying densities of the gases contained in the air-cells. These varying densities are produced by the expansion and contraction of the size of the cavity of the chest by the muscles of respiration and the resiliency of the chest walls, thus causing an increase or diminution in the size of the air-cell, and a difference of density in its contents. Thus in ordinary inspiration, the capacity of the chest is increased about one-tenth, or perhaps more, and the air in the cells becomes rarefied to a like extent. What is the effect of rarefaction (1*st*) on the air brought in by the trachea and the minute bronchial tubes to the air-cells; and (2*d*), on the venous blood from the pulmonary artery circulating in the very thin membrane forming the inner coating of the cell? It has a like effect on both, though in a different degree. (1*st*), The air rushes down the trachea to render the gas contained in the cells of the same density as the external atmosphere; and (2*d*), the gases, carbonic acid, etc., dissolved in the venous blood circulating in the minute capillaries of the cell are given off in greater quantity when the density of the gas in the cells is reduced. This last effect is doubtless caused by the well-known law that gases dissolved in liquids are more easily given off when the atmospheric pressure is lessened.

In expiration, the reverse of all this takes place. The air in the ultimate cells of the lungs is compressed and a double action is again induced, the larger proportion of the gaseous contents is driven out through the bronchial tubes and trachea, but the venous blood circulating in the walls of the cell absorbs a larger quantity of the gases by virtue of its increased pressure (in obedience to the law that liquids under an increased pressure of gas absorb more of that gas) than when the density is less.

It is quite true that, in ordinary respiration, the difference in pressure is not very great, but still it seems to me that the difference is sufficient to determine the extraction of a considerable amount of carbonic acid from the blood in the air-cells of the lungs, and to cause the absorption of a considerable portion of the mixed gas, which is found in the cell, the largest portion of which absorbable gas is oxygen.

The sequence in respiration appears to me to be diminished density of gas in the cells of the lungs, entrance of—(*1st*), air from trachea and minute bronchi, (*2d*) gases dissolved in the blood through the very thin membrane of the pulmonary cells. Then succeeds a point of stasis, when the density of the intra-cellular gas is equal to the atmospheric pressure without, and for that instant the interchange goes on in obedience to the laws of diffusion of gases through a moist membrane untrammelled by varying pressure. Then succeeds expiration, when, by the diminution of the size of the chest, the gas in the cells is condensed and the converse of inspiration takes place, the mixture of air, carbonic acid, etc., is expelled—(*1st*), through the bronchial tubes and trachea; (*2d*), an increased quantity of the mixed gas in the auricle is absorbed by the blood as it circulates on the cell-wall. Then succeeds an instant of equalization, as before, between the acts of respiration, and inspiration again commences the sequence.

I do not enter at all into the vital affinities of the blood-corpuscles and oxygen, my intention only being to point out how certain small variations in the density of the air in the cells assist in determining the extrication of carbonic acid from the blood, and also cause oxygen to be absorbed more freely.[1]

It must be observed that the gas, released from the blood under diminished pressure, will not be carbonic acid only, but the mixture of gases combined with the corpuscles dissolved in the serum, so also the gas absorbed by the blood under increased pressure will not under the operation of the law be simple oxygen, but the mixture of gases contained in the air-cell.

The question is purely a physiological one, but the explanation given above seems to me to assist us in understanding how the changes take place.

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[1] I do not take into account the expansion of the gas through increased temperature, though this, doubtless, will have some effect in increasing pressure just at the time that stasis is present.

ARTICLE VI.—*On the Etiology and History of Leprosy.* By W. MUNRO, M.D., Manchester, late of London.

(*Continued from page* 509 *of* vol. xxiii.)

Exposure.—The idea that exposure can at least favour the production of leprosy has been spoken of by Daniellssen and Boeck,[1] but there seems to be no proof sufficient to support it. It may be admitted that when once the disease is established, exposure may, and probably does, increase the mischief in a disease in which weakness of the circulation is a decided symptom; but, from its great prevalence in the most beautiful climates, as that of Rhodes and Santarem, and its rapid spread in the Sandwich Islands, with other examples which might be quoted, as well as from its absence from the most rigorous climates, it is clear that exposure is not a necessary factor in its production, although in some cases it may assist in aggravating its effects.

Salt Food.—This has been supposed to at least assist in the causation of leprosy by many authors, as Schillingius,[2] Larrey,[3] Wortabet,[4] H. H. Wilson, speaking of it among the Hindoos, and quoting their opinions,[5] and Cazenave and Schedel;[6] Daniellssen and Boeck speak as if they considered the use of either fresh or very salt fish assisted in causing it.[7] In the Coll. of Phys. Rep.,[8] and Dr Milroy's,[9] a number of opinions to this effect are expressed, and Peacock thinks so from observations in Portugal.[10]

By those writers it seems to have been left out of consideration that salt food is extensively used in many parts of the world where leprosy is unknown, as Newfoundland, Canada, the west coast of South America, and the greater part of the Mediterranean coasts, while in the Sandwich Islands, long before leprosy was known, salted pork was constantly eaten.[11] Again, in China most leprosy is seen in the south and in Shanghai, yet in the neighbourhood of the latter the people use very little salt;[12] while in the north, where leprosy is unknown, the enormous salt mounds in the neighbourhood of Tientsin, described by every traveller, show that there is no want of it there. In Portugal, religious orders using salt food exclusively have no leprosy among them.[13] In the Faroë Isles, where leprosy was common, fish was eaten "without any

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[1] P. 257.
[2] *Lib. cit.*, p. 21.
[3] *Lib. cit.*, p. 221.
[4] *Op. cit.*, p. 190.
[5] *Lib. cit.*, p. 3.
[6] *Lib. cit.*, p. 356.
[7] *Lib. cit.*, p. 342.
[8] *Vide*, pp. xxxiii., lxvii., 171, 201, 219. At p. 201 acids are mentioned as a cause, an idea derived from Hindoo writers.
[9] Pp. 9 and 16 in Dr Harris's "able report."
[10] *Lancet*, 1870, vol. ii. p. 776.
[11] King, in Cook's Voy., vol. viii. pp. 119 and 128. Boils and ulcers common among them are attributed to the great quantity of salt consumed (vol. vii. p 113).
[12] Coll. Phys. Rep., p. 78.
[13] Landré, p. 34.

salt,"[1] and in India and Africa, the ancient foci of leprosy, salt is *a luxury* unknown to millions.

These writers also seem to have forgotten that salted food is seldom eaten as such, a taste such as that of the Sandwich Island chiefs being unusual, but is generally soaked before being cooked, unless when it is simply used as a relish with a large quantity of vegetable diet, and even in that case the blacks eat it with vinegar to take away the taste. In Norway, again, salt and semiputrid fish is eaten to as great an extent on parts of the coast where leprosy is rare or unknown as in those where it is common.[2]

It is clear then that salt food, as such, has no influence in either producing or increasing the disease, although, as being poorer food than fresh, the best part being lost in the brine,[3] and what remains, being rendered less digestible, its use may assist in lowering the general health of those using it, and so probably increase their susceptibility to the disease.

Poor Food and Deficient Food.—From the time of Galen[4] and Aretæus,[5] a poor diet has been looked on by many as a cause of leprosy.[6] Others, in contradiction, have pointed to its existence among all classes, from kings downwards, in the Middle Ages,[7] and among all classes alike in Madagascar.[8] In India, rich Europeans are affected, as well as natives of the very highest classes.[9] So far, however, as such cases as King Robert the Bruce is concerned, it must be remembered that the food eaten by kings and courtiers of the Middle Ages was in many respects inferior to what is now used by the middle classes. Thus, Philip de Blois says, "I have sometimes seen wine so full of dregs put before noblemen that they were compelled to filter rather than drink it, with their eyes shut and their teeth closed, with loathing and retching—meat, whether sweet or not, is sold alike. The fish is four days old, yet its stinking does not lessen its price—indeed the tables (sometimes) are filled with carrion." Its existence among rajahs and well-to-do Europeans and others, contagion will account for; while it must be remembered that even the best-fed people within the tropics are more or less anæmic and debilitated. It may be true, as Carter says in his "Report on Leprosy in Norway" (p. 11), that leprosy attacks the robust as well as the weak and ailing; but there are no statistics available to show that they are attacked in as great a proportion, while, as I have already shown, the history of the disease shows that it has always declined where the food of the people and their general hygienic conditions have improved,[1] and has never spread among a flesh-fed population.[2] In India the condition of great masses of the people is, and for ages has been, that of chronic starvation, of which the late and present (1877) famines are only aggravations. In the Census Reports for the N.-W. Provinces, it is stated,[3] "hunger is a prominent symptom, and chronic starvation, both from a deficiency in the quantity of food, and in almost an entire absence of one or more of the ingredients essential to health, is by no means of uncommon occurrence." The people are chiefly fed on "behjur," a mixture of several kinds of grain, and the ordinary quantity consumed by the agricultural labourers *does not contain one-half* the nutriment that is just sufficient to preserve health, as supplied in the food given to prisoners in the jails. In China matters are little better.[4] I wish it distinctly understood, however, that I do not in the least believe that any amount of starvation can *produce* leprosy. Its absence in North China, where, in Tien-tsin, death by starvation is by no means uncommon,[5] people living actually on the offal thrown from the ships; and in Tierra del Fuego, where the wretched inhabitants are often reduced by starvation to the horrible necessity of roasting and eating their old women,[1] as also from among the aborigines of Australia, next the Fuegeans, the most degraded of human beings, and from the entire western side of the Andes, where the food was poor and insufficient,[2] or among poor tribes of North American Indians, exposed to the most fearful famines, so that they would eat one another, even their own families,[3]—such examples of its absence as these show that something more than simple poverty of diet is required to produce the disease; at the same time, as I have already indicated, I have little or no doubt that, where such conditions exist, a population is more prepared for and more likely to suffer from leprosy when it is once introduced.

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[1] See quot. from Debes in Liveing, p. 29.

[2] Carter, Rep. on Lep. in Norway, p. 11.

[3] See Blyth, Dic. of Pub. Hygiene, p. 363. One-fourth of the fibrine and six-sevenths of the albumen is lost.

[4] De Arte. Cur., lib. ii. c. x. De Cancris.

[5] *Lib. cit.*, p. 179.

[6] See Schillingius, § xxxi. Wortabet, *op. cit.*, p. 189. Virchow, *lib. cit.*, pp. 507 to 509. Nourse, *op. cit.*, and Coll. Phys. Rep., pp. 3 (New Brunswick), 64 (Crete), 72 (Persia), 93 (Ceylon), 134, 137, 144, 160, 171, 195 (India), etc., etc.

[7] Robert the Bruce of Scotland, and Baldwin IV., King of Jerusalem, died of it (Simpson, *op. cit.*, p. 394).

[8] Coll. Phys. Rep., p. 221.

[9] Macnamara, p. 38 (Rajah of Parsee); Coll. of Phys. Rep., p. 158 (Rajah of Jansi).

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[1] A special instance of this is seen in the Faroë Isles, where, with great improvements in agriculture and diet, leprosy has disappeared.

[2] At first sight the prevalence of leprosy at Santarem might appear a local contradiction of this, as Bates specially says that flesh meat is cheap. It by no means follows, however, that it is used by all classes; it is much more likely that it *is* cheap, partly because the demand is confined to the better classes, while the great quantity of salt fish (vol. ii. p. 10) shows what, with vegetables, is the real staple food of the population as a mass. But Livingstone, in his Last Journals, vol. ii. p. 40, speaks of the existence of "partial" leprosy among the Manyuema, who seem to live in a great measure on "durra," the meal of millet, but who also have a plentiful supply of flesh food (p. 148). It by no means follows, however, that *all* the population enjoy its *use*, such food being often reserved for the chiefs and males. If further information should show that all do obtain it, we would then know that even a flesh diet is not an absolute protection of a population *within the tropics;* it being always remembered, however, that sedentary tropical races and tribes do not, as a rule, use as much flesh meat, even when obtainable, as natives of the temperate zone.

[3] Pp. lxiv. and lxxiii.

[4] Coll. Phys. Rep., 78. Durand Fardel (La Lêpre en Chine, *Gazette Medicale de Paris*, 18 Août 1877) mentions that rice is the basis of the food of the mass of the population, salt fish and the like being only used as a relish. Some cannot even obtain rice, and use potatoes. The rice is always insufficient in quantity. He also states that the province of Canton is the chief seat of leprosy in China, yet is, on the whole, the best fed. If this is true, it increases the probability of what I have already said,—that leprosy has been at least increased in that province by its constant commerce with India, and the immense number of Mahomedans and others who resided there 1000 years ago.

[5] *Vide* "All Round the World," p. 149. Tien-tain means "heavenly felicity" (!) the misery in it is a horrible caricature on the name.

Poverty and Malhygiene.—Much that has been said in regard to poor diet also applies to this part of the subject. The history has shown that wherever a decided improvement has taken place in the general condition of the people, leprosy, even when prevalent formerly, has decreased. Carter, indeed, our leading author on the pathology of leprosy, expressed a contrary opinion early in 1873, then thinking that faults of diet, hygiene, or habit equally fail to account for its varied distribution;[4] but he seems to have hardly taken the history into consideration, and the example he quotes of the disease being "nearly as frequent"—(in reality, as I have already stated, 50 per cent. more so), in the elevated Deccan Plain, Bombay, with better food than in the Koncan—proves nothing, and may be explained by his own observations, already quoted in regard to Kattiawar, unless it could be shown that improvement in hygiene *within these districts themselves* had not been followed by a decrease in the number of lepers; while, that such a state of matters is purely local and not to be taken as the foundation for any argument, is seen by a comparison with Syria, where leprosy is unknown in Aleppo and Beyrout, and other sea-coast towns, where people are comparatively well housed and fed, and cleanly, while it is common in the villages of the interior where they are dirty and live in poverty.[5] My own belief is that, so far as poverty is a depressant, leading to an anæmic state of the blood, and so far as malhygiene consists in or leads to overcrowding, so forcing the sick and healthy into *intimate contact*, as in the West Indies, where seven or eight people often sleep in a hut ten feet square, so far they tend to the increase of leprosy.

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[1] Darwin, "Jour. of Voy. Round the World," 1845, vol. ii. p. 214. They prefer eating the old women to eating their dogs, because the latter can catch fish, while the old women are useless; I ought to have quoted the Fuegeans as fish-eaters solely who have no leprosy among them. The Californians also used almost nothing but fish (Beechy, vol. ii. p. 74).

[2] Cartwright, in *Br. Med. Jour.*, 18th Dec. 1875, Lecture on the Scope of Dental Surgery. [3] Kane, in *Household Words*, 26th March 1859.

[4] "Observations (1869-71) communicated on Pathology of Leprosy." *Lancet*, Ap. 1873, and Rep. 1874, p. 20.

[5] Coll. Phys. Rep. pp. 78, 93, 133, 191, xvii. Wortabet, *op. cit.* p. 189.

But *filth* has often been put forward as a cause of the disease. I agree with Carter, to a certain extent, however, that it has *per se* no influence, at the same time its non-removal, like overcrowding, may assist in the propagation of the disease by increasing the chances of inoculation, the contagious matter being allowed to remain in contact with the healthy skin, while with cleanliness it would be washed away.[1] I have no doubt that the condition of matters in England depicted in the sonnet, "The King and the Miller of Mansfield," in which the miller, thinking he is speaking to a royal page, asks—"Hast thou no lousen in thy shoon?" or in which the gentlemen of the Earl of Northumberland (of 1512) were allowed 2s. yearly to pay for washing their body linen, while those slightly under them appear to have had no body linen to wash,[2] would assist in the propagation of leprosy in the manner I have indicated. So in the present day the filthy state in which many of the Negroes and Portuguese in the West Indies live, almost equal in some cases to that of the old Manganja, who told Dr Livingstone that he *had* washed *once* in his life;[3] and of the Portuguese in the Brazils who, even respectable families, look on an Englishman's morning wash as an extraordinary and somewhat insane proceeding, would at least prevent the removal of the contagious matter when brought into contact with the skin, and is probably, along with the indifference in regard to coming in contact with the sick among these people, one cause for its excessive prevalence. The same may be said of the Chinese, and more emphatically of the lower class Bengalese, who let their filthy rags rot off their bodies.[4] This is especially noted in Dehra Doon, where leprosy is very prevalent. Thomson[5] notices the same disgustingly filthy state of the New Zealanders affected with "ngerengere," and specially notices that the inhabitants who bathed frequently had not the disease among them.

But that no amount of filth can ever *produce* leprosy is clearly enough shown by its absence from the slums of London, and the Cowgate of Edinburgh, within the last two decades. The natives of uninfected parts of Norway, again, are neither more nor less cleanly in their homes or persons than those of the infected parts. The same may be said of Greece[6] where there are "vermin everywhere." The filth of the "noble savage" of North America I have already referred to,[7] while that of the Esquimaux,[8] of the natives of California,[9] and of Nootka Sound,[10] among none of whom has leprosy ever been seen, show that something more than simple filth is required to produce it; while, on the other hand, its spread among Europeans in hot climates, where to them the daily bath (often twice daily) is an absolute necessity; among the Foulahs of Central Africa, who "often wash the whole body,"[1] and are "neat and clean;" and among the Sandwich Islanders, also a cleanly people,[2] shows that cleanliness alone is not of itself sufficient to check its spread, once the contagion is introduced among a population prepared by other circumstances for its attacks.

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[1] Rep. on Lep. in Norway, p 55.

[2] Hugo Arnot, "Hist. of Edinburgh," p. 61.

[3] Zambesi, p. 119.

[4] Coll. Phys. Rep., pp. 133, 15.

[5] *Op. cit.* p. 501.

[6] Roving Englishman, *Household Words*, 1853, p. 473.

[7] Welch (*Lancet*, vol. ii. 1874, p. 796) speaks of their filthy condition in New Brunswick.

[8] Beechy, p. 365 (and others).

[9] *Ibid.*, p. 76.

[10] Cook, vol. vi. p. 279.

Putrid Food.—The theory that the eating of food in a putrid or semi-putrid state is a *bonâ-fide* primary cause of leprosy has been advocated by several authors, whose opinions are worthy of being treated with respect, and has, at first sight, some plausible arguments in its favour. On more careful and extended examination, however, it will not hold good.

The use of tainted and putrid food by tribes of Central Africa, among whom the disease is prevalent,[3] also among Negroes in Surinam,[4] among the Chinese to a limited extent,[5] among some of the natives of India,[6] as also in Bergen in Norway,[7] in Portugal,[8] at Jerusalem,[9] and finally among the natives of New Zealand,[10] who purposely allow their maize to become putrid—all appear to prove that the use of such food has some essential connexion with the origin of leprosy; but we must remember that the description[11] of the food given by Schillingius can only be applied to Surinam, the West India negro, at least of the present day in the British Islands, not using putrid food.[12] Among the Chinese, again, I have already said rice is really the chief diet, while in India it is also with pulses of various kinds the chief food, animal food being entirely prohibited to the Hindoos, while the use of putrid fish is by no means common, being only noticed a few times in the College of Physicians' Report. Nor do the places where the use of such food is noticed correspond in the least degree with the places where leprosy is most common, as for instance in Meerut, where there are only 2·9 lepers per 10,000 of population, and in Chittagong, *with the fewest lepers in the Presidency of Bengal* (1 in 3679), putrid fish being used as food is spoken of, while in Dehra Doon, with 19 in 10,000, no such habit is remarked on; and in Kumaon (21 in 10,000) Drs Lewis and Cunningham did not observe it. Dr Macnamara also says,[1] "the natives (of India), as a general rule, are not in the habit of consuming putrid fish," and points out that in Behar, where leprosy is common,[2] the people are cleanly, bathing daily, and are on the whole fairly fed, as described in the Report he quotes from.[3] The food is chiefly vegetable. The existence of the disease among Europeans in the tropics could have no connexion with the use of putrid food.

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[1] Caillé, pp. 223 and 225.

[2] Ellis, vol. ii. p. 77.

[3] Du Chaillu, pp. 390 and 457; Park, p. 51 (putrid fish); Livingstone, Zambesi, pp. 119, 305, and 373; Last Journals, vol. i. pp. 121 and 131, and vol. ii. pp. 41 and 149 (Manyuema Cannibals). Livingstone only speaks of "partial lepers" in the last quoted instance.

[4] Schillingius, p. 21.

[5] Davis, vol. i. pp. 235 and 404, and Durand Fardel, *op. cit.*

[6] Coll. Phys. Rep., pp. 136, 157.

[7] Carter, Rep., 1876, p. 146.

[8] Peacock, *Lancet*, 1870, vol. ii. p. 776.

[9] T. Fox, *Ed. Med. Jour.* 1868, p. 802.

[10] Thomson, *op. cit.*, p. 501, and Cook, vol. ii. pp. 44, 46.

[11] They still sometimes eat putrid salt-fish in Surinam (Landre, p. 62).

[12] By an Act passed in 1798 (see Antigua and the Antiguans, 1844), affecting all the Leeward islands, each slave was bound to receive nine pints of corn or beans, or an equivalent in wheat or other flour or meal, or double the quantity of potatoes or other esculents, or thirty pounds of plantains weekly; also one pound and a quarter of salted or double that of fresh fish, all of good quality; showing that three quarters of a century ago the Negroes were by no means starved or forced to eat putrid food.

On the other hand, too, leprosy is *not* seen among many tribes and peoples who daily use putrid food—as the Kalmucks, various Mongol tribes,[4] in Dahomey,[5] and among the natives on the west coast of America, from Tierra del Fuego to Vancouver's Island,[6] as well as among the Esquimaux of the north coast, to whom a dish of whale's blubber, which has been buried some weeks or more, and has become thoroughly putrid,[7] is as great a delicacy as "high" pheasant on the tables of the higher classes in England. The natives of Nootka preferred absolutely putrid whale flesh to fresh.[8]

Thus, there is no proof that the use of putrid food, as such, has any influence on leprosy, although it may, from its loss of nutrient power, play a very subordinate part in the manner I have indicated that "poor food" probably does.

The question may be asked, Can the use of fish, with famine, filth, exposure, and putrid food produce the disease? This is answered by its absence in Tierra del Fuego, where all these conditions are found in the highest intensity, the climate being one in which, even in summer, sleet and snow are common, while clothing can hardly be said to be worn, and the habitations, mere temporary erections, are not worthy of the name of huts, the state of filth in which the people live is horrible to think of, and the most delicious *bonne bouche* they ever obtain is a mass of putrid whale, their ordinary food being shell-fish.

[1] *Op. cit.*, p. 36.

[2] 1 in 1800, Census of Bengal, xcviii.

[3] See Coll. Phys. Rep., p. 136.

[4] Prejavalsky, *lib. cit.*, vol. ii. p. 240.

[5] Sketchley, pp. 59 and 491.

[6] See Bougainville, in Kerr's Collection, vol. xiii. p. 189; Wallis, *ibid.*, vol. xi. p. 140–2; Candlish, *ibid.*, vol. x. p. 76; Cook, vol. v. p. 295; also Darwin, *lib. cit.*, vol. ii. p. 214.

[7] Beechy, pp. 371 and 432.

[8] Hewit, *lib. cit.*, p. 135.

(*To be continued.*)

Plate I.

Fig. 1.

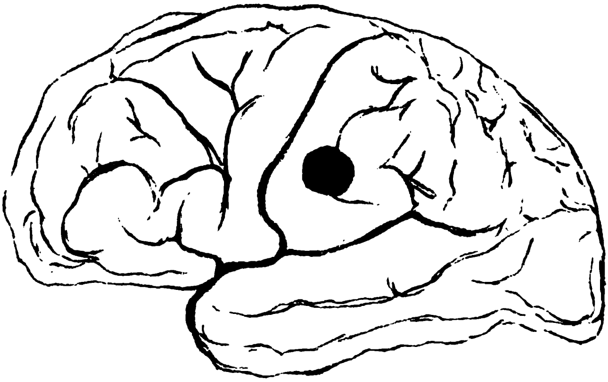


Fig. 2.

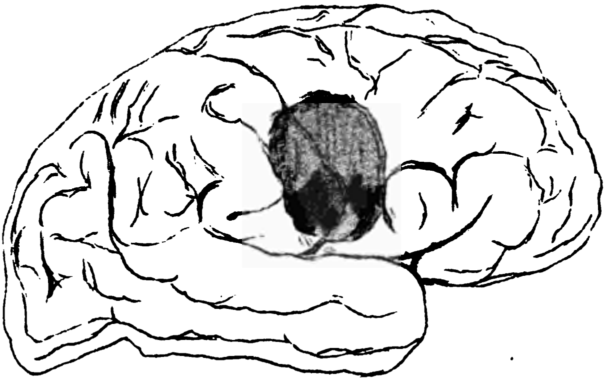
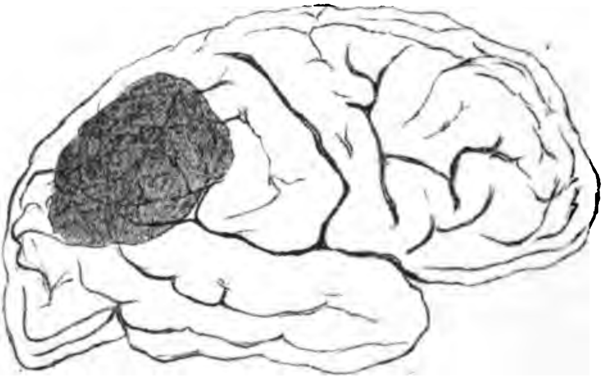


Fig. 3.



J. Bartholomew Lith.

ARTICLE VII.—*Cases of Intra-Cranial Tumour.* By BYROM BRAMWELL, M.D., Physician and Pathologist to the Newcastle-on-Tyne Infirmary, Joint Lecturer on Clinical Medicine and Pathology in the University of Durham College of Medicine, Newcastle-on-Tyne.

(Read before the Northumberland and Durham Medical Society, and communicated in abstract to the Medico-Chirurgical Society of Edinburgh on 5th June.)

AT the Edinburgh meeting of the British Medical Association I had the honour of reading before the Psychological section the notes of a case of unilateral convulsions, in which a lesion of the cerebral cortex was produced by a small projecting spiculum of bone. (The skull cap and photographs of the brain showing the exact position of the lesion were exhibited.)

The case, which is a very valuable and instructive one, is reported in the *British Medical Journal* of 1st September 1877. I am glad, however, of an opportunity of adding to the somewhat meagre comments which I have already made upon it.

Dr Hughlings-Jackson has remarked that cases of disease are the *only experiments* which we can observe *in man*, and that "there is no other way of ascertaining the localization of movements in the cerebral hemispheres of *man*, than by a study of his convulsive seizures."

In most cases the experiment is necessarily a "rough one." Cases of this description—I refer to cerebral tumours implicating the convolutions—are notoriously of long duration. The symptoms, which in the earlier stages were perhaps well-defined, often become complicated towards the termination of the case. The post-mortem lesion is found to be proportionately extensive, hence the deductions drawn are more or less uncertain.

It would be difficult to imagine a case of disease which more rigidly fulfilled the requirements of a physiological experiment than the one I am describing. The lesion was singularly well-defined and of limited extent, the remaining portions of the brain were absolutely healthy, and the resulting phenomena, *i.e.*, the convulsions, were most definite in character.

Position of the Lesion.—The lesion was situated in the left *ascending parietal convolution*, an inch above the fissure of Sylvius. It corresponded to a small transverse fissure which extended between the fissure of Rolando and the parietal fissure. (See Fig. 1, Plate i.)

The very careful microscopical examination which was kindly made by my friend Dr Herbert Major, showed that the destruction of brain tissue was exceedingly small, and yet the resulting phenomena, the convulsions, were of considerable extent. The lesion was, in short, a "discharging," not a "destroying" one.

Character of the Convulsions.—The convulsive paroxysms were of three kinds—*slight, moderate,* and *severe.* In all "the march of the spasm" was the same.

In the *first* or *slight* form, the muscles of the face and neck were alone affected. Both eyes were firmly closed, and the right corner of the mouth drawn down in tonic spasm, the platysma being rigid. The eyes were then partly opened; the head and eyeballs slowly rotated to the right. Clonic spasms next occurred in both eyelids, the right being affected much more powerfully than the left; in the muscles of the tongue, right side of the face and neck, the platysma being chiefly affected. After a short interval the spasms became less frequent, the head and eyeballs were slowly turned back to the middle line; the eyelids were widely dilated, and the patient presented an animated appearance. The eyeballs were finally rotated upwards and to the left, the eyelids closed, and the patient apparently fell asleep.

In the *second* or *moderate* form, the convulsions commenced as before. After the head had been rotated to the right, and as the clonic spasms were commencing, the fingers of the right hand were drawn in to the palm, the hand was then flexed at the wrist, the forearm bent to a right angle and placed across the chest. The muscles of the right leg at the same time became rigid, and the foot strongly inverted. Clonic spasms then occurred in the muscles of the arm and forearm, the flexors being chiefly affected. A few spasmodic twitchings were to be seen in the leg and thigh, chiefly in the extensors. There was never any flexion of the hip or knee.

In the *third* variety the convulsions became general. The fit commenced as before, and passed through the various stages enumerated above. After flexion of the right forearm, the arm was slowly raised at the shoulder until it was nearly at a right angle with the body, the tonic spasm then passed to the muscles of the left arm and of the left leg in the following order:—The fingers of the left hand were first drawn in to the palm, the arm was then raised upwards and brought over to the right side, so that the hand approached the forehead, the left leg was at the same time flexed upon the abdomen, the knee being slightly bent, the toes spread out, and the foot flexed at the ankle-joint. The tonic spasm soon passed off. Clonic spasms of the muscles generally occurred, the patient foaming at the mouth, and making a cackling noise. As the clonic spasms occurred, the left arm was abducted and placed at a right angle with the body, the under surface of the arm, forearm, and hand being uppermost. As the spasm passed to the left arm and left leg, both sides of the face were strongly convulsed.

The muscles of the right side were always more strongly affected than those of the left.

Frequency of the Convulsions.—The *slight* fits occurred every few minutes, the *moderate* ones frequently, the *severe* ones only occasionally—six or eight in the twenty-four hours.

Remarks.—The following conclusions may, I think, be fairly drawn from this case:—

1st, That a limited "discharging" lesion of the human cerebral cortex produces definite and constant muscular movements.

2d, That the action of the hemispheres is in general crossed, but that movements of those muscles which act habitually together, such as the orbiculares palpebrarum, are bilaterally co-ordinated from such hemisphere (Dr Broadbent's *Hypothesis of the Mechanism of Bilateral Movements*).

3d, That the muscular movements which resulted in this case from irritation of a particular spot in the cerebral cortex closely corresponded to the muscular movements which Ferrier produced by galvanic stimulation of homologous centres in the lower animals.

The position of the lesion corresponds to Ferrier's centres (11) and (13), and is in close proximity to (*a*) and (10).

On stimulating these centres Ferrier obtained the following results:—

(11) "Retraction of the opposite angle of the mouth. The platysma myoides is thrown into action, and when this is powerful, the head is drawn slightly to the side."

(13) "The eyes move towards the opposite side and upwards."

(*a*) (*b*) (*c*) (*d*) "Individual and combined movements of the fingers and wrist."

(10) "Opening of the mouth, with retraction of the tongue."[1]

In the case I am describing, retraction of the opposite angle of the mouth, and rotation of the head and eyes to the opposite side (11) and (13), were always observed. But, in addition, the eyes were closed, and the orbiculares thrown into clonic spasm. Ferrier places the centre for the eyelids (12) in the middle frontal convolution, or its homologue in man, a point at some distance from the lesion in this case. The results then, in this particular, do not exactly correspond.

4th, That the proximate causes of the different epilepsies are, as Dr Hughlings-Jackson supposes, discharging lesions of the centres in the cerebral hemispheres.

5th, "That the limited irritation which manifests itself in a limited convulsion has a tendency to become diffused and to involve the whole of the cortical centres, so that what at first was merely a local convulsive spasm, without affection of consciousness, may gradually gain in range and intensity until, along with the motor perversion, we get the loss of consciousness, which is regarded as an essential factor in the true epileptic seizure."[2]

6th, That, in this case, in which the convulsion commenced in the right side and spread to the left, the muscles of the second side first invaded were those most in voluntary use, viz., the muscles of the fingers and thumb.

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[1] *Functions of the Brain*, page 143.

[2] Ferrier, Experimental Researches in Cerebral Physiology and Pathology, *West Riding Hospital Reports*, 1873, page 90.

Cases in which convulsions begin on one side and reach the other, are exceedingly rare. Indeed, no less experienced a physician than Dr Hughlings-Jackson says he has seen few cases, and asks as to the second side,

"*1st,* Is the arm or the leg first affected?

"*2d,* What part of either of the two limbs does the spasm first reach? Does it first reach their upper parts (shoulder and thigh) or their lower parts (hand and foot)?

"*3d,* Does it specially affect any groups of muscles, *e.g.*, extensors or flexors?"[1]

In this case, the *upper* extremity was first affected. The spasm commenced in the *fingers and thumb.* The *flexors* of the fingers hand, and forearm were chiefly involved. (For the exact order of the spasm, see page 142.)

This is contrary to Dr Hughlings-Jackson's theoretical view. He says, "We should expect, then, that when a fit begins in the hand of the 'first side,' that the spasm in the convulsion of the 'second side' would invade the parts of the second side in a manner different from the invasion of the first side." And, again, "From a few observations, and from hypothetical considerations, I should expect that when a convulsion begins in the hand, the spasm reaching the 'second side' would affect first and most the parts affected last and least in the 'first side' (head, eyes, leg, trunk first, and limbs last)."[2]

Before passing on to the other cases of intra-cranial tumour which I propose to record in this paper, I will relate a case of acute tuberculosis in which a lesion of the *right ascending parietal and ascending frontal* convolutions caused left-sided unilateral convulsions.

CASE II.—*Acute Tuberculosis. Cough. Shortness of Breath. Sudden Loss of Power in the Fingers and Thumb of the Left Hand. Left-sided Unilateral Convulsion without Loss of Consciousness. Post Epileptic Hemiplegia and Aphasia. Convulsive Twitchings of Left Platysma and Left Orbicularis Palpebrarum. No Headache. Autopsy: General Tuberculosis; Limited Deposit on the Surface of the Right Ascending Frontal and Ascending Parietal Convolutions; Healthy Condition of the Membranes of the Base.*

G. S., æt. 27, a labourer, single, was admitted to the Newcastle-on-Tyne Infirmary, under my care, on 27th January 1876, suffering from cough, shortness of breath, and left-sided hemiplegia.

His illness had commenced five weeks previously, after exposure to cold. The first symptoms were cough and shortness of breath.

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[1] *West Riding Hospital Reports*, 1873, page 338.
[2] *Ibid.*, vol. vi. page 293.

There had been neither pain nor expectoration. Before the attack his health had always been remarkably good.

On 8th January, three weeks before admission, and two weeks after the commencement of his illness, he suddenly lost the use of his left hand, so that the shovel with which he was working fell to the ground. There was no trembling nor twitching in the muscles before the paralysis set in. He was not giddy. There was no headache nor affection of speech.

On 13th January, at 9.30 P.M., he was seized with a convulsive trembling in the left arm, leg, and left side of the face. The fit continued for three quarters of an hour; both eyes "worked." He was quite conscious during the attack. When the convulsion passed off he found that he was unable to speak, and that he had lost the use of his left arm and leg.

On 15th January he had a second and similar fit.

On 17th January a third.

Since the date of the last fit he has been gradually regaining the power of the arm and leg. Speech returned on 18th January. When he did begin to talk, he had no difficulty in finding words, only hesitation and difficulty in pronouncing them. He has been in the habit of using his left hand as much as his right, because, he says, of a rupture on the right side. He is not, however, left-handed in the true sense of the word.

He has not had any headache or vomiting.

He has not suffered from syphilis.

The family history is good.

Present Condition.—The patient, who is an intelligent man, is very drowsy, and looks extremely ill. The temperature is 103° F.; pulse, 100; respiration, 34; the lips dry and cracked; the tongue brown and tremulous. Both lungs are extensively consolidated, the left at its apex, the right at its base. On auscultation metallic crepitation is heard over the dull areas, and sibilant râles over the other parts of the chest. There is frequent cough, but little expectoration.

There is marked loss of power in the left arm, left leg, and left side of the face. The tip of the protruded tongue is turned to the left side. The paralysis is complete in the fingers and thumb of the left hand. Sensibility is lost in the left thumb and forefinger, impaired in the other fingers, and in the forearm.

There are frequent convulsive twitchings of the left platysma, left orbicularis, and left levator palpebræ superioris.

The pupils are equal and moderately contracted. On ophthalmoscopic examination the discs look red, and the veins are large and tortuous, but there is no œdema.

The other organs seem normal.

Progress of the Case.—On 1st February the urine contained a small quantity of albumen and some hyaline and granular casts. After this date he rapidly got worse, and died on 9th February, No new nervous symptoms developed. The temperature averaged, morning 102°·5, evening 103°·3, the highest morning temperature being 104°·8, the highest evening temperature 104°·6.

The pulse averaged, morning 106, evening 115. The highest evening pulse was 148, the lowest 82.

The post-mortem was made twenty hours after death. The lungs were stuffed with miliary tubercles. There were several small cavities in the left apex; both bases were consolidated. Some of the deposits were caseous. The peritoneum was studded with tubercles. The pelves of both kidneys were studded with tubercles, the deposits varying in size from a pin's head to a split pea.

The arachnoid and pia mater were adherent to the brain tissue in the neighbourhood of the right fissure of Rolando, and there were on the surface of the ascending parietal and ascending frontal convolutions numerous tubercular deposits surrounded by greenish lymph. These appearances were most marked at the lower parts of the ascending parietal and ascending frontal convolutions. At these parts the brain substance was invaded and softened. (See Fig. 2, Plate i.) The softening extended through the various layers of the cerebral cortex, but did not involve the white matter. There were a few tubercular deposits in the right Sylvian fissure, and one or two in the left. The membranes at the base and over the left hemisphere were normal. The other parts of the brain were healthy.

Remarks.—The lesion in this case was much more extensive than in the one previously related. The parts involved corresponded to Ferrier's centres (*a*), (11), (10), posterior halves of (9), (8), and (7). The resulting phenomena were—convulsions of the opposite arm, leg, and side of the face; paralysis and loss of sensibility in the parts convulsed, and aphasia.

The paralysis which followed the convulsions was evidently "post epileptic" in character. The aphasia, too, was clearly of the same nature. It is interesting to observe that this loss of speech was associated with left-sided convulsions. In explanation I may notice the circumstance that the patient had for some years been ambidextrous; possibly, therefore, in him the speech centre was not confined to the left hemisphere. This explanation must be taken for what it is worth, for the next case shows that in a right-handed person this form of aphasia (post epileptic) may follow left-sided convulsions.

I am doubtful as to the character of the paralysis of the fingers and thumb. The circumstance that the loss of power in these parts was not preceded by any tremor or convulsion gives some weight to the supposition that the paralysis was genuine, *i.e.*, not epileptiform. The fact that the lower end of the ascending parietal convolution was the part most destroyed by the lesion, supports this theory, and confirms Ferrier's observations.

The motor phenomena of the case, then, corroborate the views of the localizers. It is difficult on the same theory to account for the loss of sensibility, for no lesion of the sensory tract was discovered.

Other points of interest in the case are—

1st, The fact, that the tubercular deposit within the cranium was almost entirely confined to the convexity of the left hemisphere, the membranes of the base, with the exception of a few tubercles in the Sylvian fissures, being healthy.

2d, The entire absence of headache.

3d, The previous robust health and good family history of the patient.

(To be continued.)

ARTICLE VIII.—*Note of a Case of Retroversion of the Gravid Uterus.*

By J. B. BUIST, M.D., M.R.C.P. Edin.

(Read before the Obstetrical Society of Edinburgh, 27th March.)

ON the 20th of February last I was consulted by J. M., a married woman, 38 years of age. She had had seven living children (being delivered of twin girls on one occasion) and three miscarriages, and she calculated that she was about the middle of the fifth month of her tenth pregnancy. The catamenia last appeared in the beginning of October last year, and she first felt the movement of the child a week before I saw her. She complained of having had some difficulty in passing water ever since the disappearance of the menses, and that the difficulty had increased somewhat during the preceding ten days. She had no pain, but felt a burning sensation during the act of micturition. Her bowels were habitually confined, so that she required to take aperient medicine regularly. Except an occasional feeling of lassitude, her health was otherwise good. She had been troubled with difficulty in passing her water during two former pregnancies, but a mixture prescribed for her by her medical attendant gave relief on both of these occasions, and she now wished me to prescribe something similar for her. I ordered an alkaline mixture, and told her that if she was not relieved by it, that it would be necessary for me to make a local examination to ascertain the cause of the difficulty. On 24th February she had felt considerably better since she commenced taking the medicine.

On the 28th of February I received an urgent message to go to see her, as she had been taken very ill during the night. On my arrival she informed me that she had been washing and hanging out clothes on the previous day, but that she did not feel anything wrong till about three o'clock that morning, when she was suddenly seized with violent pain in the lower part of the bowels. She felt so uneasy when in bed that she had got up and dressed herself. She could neither sit nor lie down without great discomfort, and felt easier when walking about. The difficulty in passing water had increased very considerably, but it was not entirely stopped. She could only pass a little at once, and the desire to micturate was more frequent.

As she was out of bed I did not make a local examination, but prescribed a grain of opium and two grains of camphor in a pill to be taken every three hours till the pain was relieved. She was also to have hot applications to the bowels. On 1st March she was no better. She was in bed, and had passed a very restless night. There was still great pain in the lower part of the abdomen, accompanied by a constant desire to pass water, but she was now unable to pass any.

On examining the abdomen, it was not uniformly distended. There was a large rounded swelling to be seen immediately above the pubes, occupying the hypogastric region, and extending upwards nearly to the umbilicus. It was well defined, fluctuating, and very tender on pressure. It was also dull on percussion. There was no pain on pressure in either of the inguinal regions beyond the boundary of the tumour. From the history of the case, the physical signs, and situation of the swelling, there was no doubt that it was the distended urinary bladder. Before passing a catheter to empty the bladder, I made a vaginal examination. On passing the finger into the vagina, it was stopped about an inch from the posterior fourchette by a large rounded tumour which filled up the hollow of the sacrum, and caused the posterior wall of the vagina to bulge forward till it was close behind the pubes. The cavity of the pelvis was completely filled by the tumour, which appeared to be as large as the head of a child at full time. On searching for the os uteri, it was found high up behind the pubes directed upwards and forwards. In front and above it could be felt the distended bladder. The forefinger could be passed into the os externum. Both lips were tense. The cervix and posterior vaginal wall were stretched tightly over the tumour. The tumour itself was firm, elastic, and tender on pressure. On making a sharp, sudden impulse against it, a body, apparently floating in fluid, could be distinctly felt to move away from the fingers. From the foregoing particulars I concluded that the retention of urine was caused by the complete retroversion of the gravid uterus.

Having fully satisfied myself of the nature of the case, I first passed a catheter into the bladder, and drew off about three pints of urine. This at once relieved the pain. I then tried to remedy the uterine displacement. The patient being on her left side, I introduced two of the fingers of my right hand into the vagina, and stretched the perineum backwards towards the coccyx till I got well behind the tumour. I then directed the palmar aspect of the fingers forwards, and pressed steadily and firmly upon the tumour upwards and forwards in the axis of the inlet of the pelvis. I exerted the pressure successively upon what appeared to be its lowest points. This proceeding caused considerable pain, and although I was sensible that I had pushed the tumour up somewhat, the patient flinched so much, and complained so loudly, that I desisted, and determined to complete the reduction next day under chloroform.

2d March.—The patient has been very well all night. She has no pain. The frequent desire to micturate is gone, and she is able to pass her water without difficulty. The bowels have been relieved by a dose of castor-oil. On making another vaginal examination, it was found that the fingers passed freely into the vagina, and that the pelvic tumour had entirely disappeared. The os uteri was felt in its normal situation directed downwards and backwards. The vaginal portion of the cervix was about an inch long. It was soft and flaccid. On examining the abdomen the fundus uteri could be distinctly felt above the pubes. It was very tender on pressure. It was evident that nature had completed the reduction of the displaced organ. A Hodge pessary was introduced into the vagina to retain the uterus *in situ*.

3d March.—Patient had a rigor last night, which was followed by some pain in the inguinal regions. The pain was relieved by poultices. She slept well. She has very little difficulty in passing water. She has very little appetite, and is pained after taking food. Pulse 84. She is unable to sit up out of bed. If she tries to do so she soon becomes giddy and faint, and is obliged to lie down. There is considerable tenderness over the lower part of the abdomen. She feels no inconvenience from the pessary.

23d March.—Since last report the patient has suffered from repeated attacks of pain, which have been relieved by opiates and turpentine stupes. She is still confined to bed, as she is threatened with rigors and faintness whenever she attempts to sit up.

I wish to direct the attention of the Society to several points in this case which appear to me to be of interest:—1. The displacement occurred in a person peculiarly predisposed to it. She had had a large family. All the labours appear to have been normal, except the first, when instruments were required. She suffered from difficulty in micturition during her fifth pregnancy, while carrying twins, and also during her eighth pregnancy, when she was delivered of a boy. On both of these occasions the difficulty was experienced towards the end of gestation. On this occasion it showed itself almost immediately after conception, so that it is probable that there was a previous partial retroversion. 2. The retroversion occurred at a comparatively late period of gestation, viz., in the middle of the fifth month—at a time, therefore, when the growing uterus had completed its ascent from the pelvic cavity into the abdomen. Doubtless the relaxed uterine ligaments at this period were unable to counteract the primary partial retroversion, and the unusual exertion was at a later period the direct exciting cause of the complete displacement backwards into the pelvic cavity. It is possible that the uterus may have been completely retroverted at the time when impregnation took place, and that the gradual development of the gravid uterus in the pelvic cavity caused the dysuria complained of from the very commencement of gestation. This, however, does not appear to me to be a tenable hypothesis, as there can be little doubt that urgent symptoms would have declared themselves at a much earlier period. It is more probable that the uterus was not completely, but only partially retroverted at first when impregnation took place, and that this partial retroversion gradually increased in degree as development proceeded. I do not think that the retroversion was complete when I saw the patient on the first two occasions, but that it took place on the morning of the 28th of February after the unusual exertion on the previous day. 3. The case illustrates very forcibly the impossibility of making a correct diagnosis of the exact cause of dysuria in pregnant women without the assistance afforded by a vaginal examination. We can only guess that there is a mechanical obstruction to the flow of urine, without being able to determine what is the cause of it. Even passing the catheter, without an examination per vaginam, only relieves an urgent symptom, without assisting to recognise the disease. I wish also to direct particular attention to the assistance which ballottement may give in distinguishing between a gravid uterus and other pelvic tumours. It would seem that ballottement can be made out much earlier in a completely retroverted gravid uterus than is the case when there is no such complication of normal pregnancy. That the accident was almost certainly recent is proved by the ease with which the reduction of the displacement was effected by nature with comparatively little assistance. It is a difficult point to determine how much force can be justifiably used in attempting to reduce these displacements, and I can only say with reference to this, that it appears to me that every case must be treated on its own merits. In this case there could not have been any adhesions which lessened the difficulty of reduction materially. 4. It is interesting to note the prolonged convalescence of the patient. It is now nearly four weeks since reduction was effected. During this period the patient has been obliged to keep her bed, and has suffered from a low form of pelvic peritonitis. This corroborates a fact which has been recognised—that retroversion of the gravid uterus is a dangerous accident, and may be followed by long illness or even by a fatal result. In this case no tendency to miscarriage has been observed.

24th April.—Patient has improved very gradually, and is now able to be up daily and to attend to most of her household duties.

ARTICLE IX.—*A few Practical Remarks on the more common Fevers of Syria.* By Dr JOHN WORTABET, Professor of Anatomy and Medicine, College of Beyrout.

THE most common form of fever in Syria is the intermittent, and its usual types are the quotidian, tertian, and quartan. In many cases it cannot be traced to a particular origin. It is apparently often caused by exposure to cold or damp; and there is some reason to doubt whether the night air of malarial regions acts in any other way than by evaporation and consequent damp. In other words, the doctrine taught in schools that intermittent fevers are produced by a specific malarial poison may here be investigated anew. Its treatment by quinine—20–30 grains during intromissions—is perfectly satisfactory. When relapses are frequent, eucalyptus or arsenic may be tried. In old and obstinate cases a combination of quinine, arsenic, and nux vomica, with cold baths, is generally successful. As a last resource hypodermic use of quinine, with a change of residence, may be tried.

The sequelæ of intermittent fevers are many, and often exceedingly troublesome—anæmia, disordered digestion, hypertrophy of spleen, diseased liver, and dropsy. In the earlier stages of these sequelæ small doses of quinine, with or without iron, are frequently sufficient, if continued long enough; and this treatment, joined to other tonic means, will be found useful in the more advanced periods. In hypertrophy of the spleen the internal use of hydrochlorate of ammonia and the external use of biniodide of mercury are generally useful, especially if employed in conjunction with other means for improving the digestive functions.

Among these sequelæ none is so serious to both the patient and the physician as abdominal dropsy. The cause of the ascites I have found from a good number of post-mortem examinations to be lardaceous degeneration of the liver. In the living subject the portal obstruction was indicated by persistent diarrhœa and peritoneal effusion. The structure of the heart appeared to be only secondarily affected. As regards the treatment I have tried repeatedly saline purgatives, diuretics, and sodorifics, as well as the opposite method by tonics; but I cannot say that I have found much benefit from either course, except in a very limited number of cases where the constitution was still good and the organic lesion not far advanced. Of purgatives, cream of tartar alone, or with jalap, appeared to be the most useful; and of diuretics, the resin of copaiba the most reliable. When the quantity of fluid is large, and the patient is suffering much distress from impeded respiration, paracentesis is a most valuable means of relief, but unfortunately only for a time, varying generally from a few days to a few weeks. I tried, in three or four cases, to keep the puncture open by a drainage-tube, and once by a slip of lint, but in every case an amount of intestinal irritation was set up, which oblige me to give up the experiment.

Febricula is very common. It prevails occasionally as a epidemic, accompanied by gastric disorder and severe pain in th loins and knees. This is called by the natives the "knee fever. Neither the common febricula nor the special form of it calls f particular treatment. It generally runs its course in a week.

Typhoid, remittent, and gastric fevers present occasionall symptoms so like each other that it becomes sometimes difficult to sa with certainty to which class they belong. Typhoid fever generall prevails as an epidemic, and is rarely fatal. The rose rash is n a necessary diagnostic, but it may be ordinarily identified by th general disturbance of the system which precedes the actual invasi of the fever, the weakness which accompanies it throughout its cours and the characteristic diarrhœa and delirium which generally appea about the beginning of the second week. I have also found Wunderlich's table of the temperature in typhoid fever of considerable hel in forming an early diagnosis.

Quinine is the great remedy for remittent as well as for intermittent fever, especially in the case of infants and children. Fro 15 to 20 grains are given to an adult during the first remission and 10 in the following one. Gastric fever is generally long, an is best treated by avoiding all irritating medicines and food, an by small doses of chlorate of potash, with laxative clysters whe needed.

Quinine, as a means for reducing high temperature in typhoi and other fevers, is a most valuable agent, and rarely fails t produce this result. I first began to use it when the thermomete exceeded 105° F., and the result was so satisfactory that I hav subsequently given it when the temperature was not so high Employed in 5-grain doses every four hours its effect is often no only the reduction of the heat, but also the breaking up of th fever. Alcohol appears to have the same effect, and in bad case the two may be used at the same time. The third means fo reducing high temperature—so extensively used now on the Continent in the treatment of typhoid fever—is cold baths; but thi measure is so severe that, beyond cold sponging, I have hesitated to adopt it.

One other most valuable agent in the treatment of fever is hydrate of chloral. Given in cases of restlessness, insomnia, or delirium, generally at night, in doses of 10 to 15 grains every half-hour until sleep is produced, its utility is beyond all doubt. The result is often a long and refreshing sleep, and a corresponding diminution of the fever.

Well-marked typhus fever is happily rare in Beyrout. I have nothing to add to what is generally known as to its cause and treatment.

ARTICLE X.—*The Sewage Question.* Number IV. By ANDREW FERGUS, M.D., Glasgow.

(*Continued from page* 48.)

HAVING in our last article traced the progress of the sewage to the confines of a dwelling-house, let us now see what ultimately becomes of it. In towns it is passed through the sewers directly into the sea tidal rivers or inland streams. We have seen how carelessly house-drains are often laid, and I am glad to be able to say that public sewers, being generally designed by men of skill, who have their plans executed under inspection, are not nearly so faulty in construction. However, from want of knowledge of the substance to be dealt with, and ignorance of the ultimate results of the decomposition of organic matter, I think we shall find that consequences unfavourable to health arise even from sewers which have been well and carefully built. If they had merely to convey water containing various matters in *solution*, they would do it admirably; but we must remember that sewage contains all kinds of refuse, both organic and inorganic, a large proportion of which is merely in suspension and liable to be deposited whenever there is any cessation of the flow of the liquid, or should any obstruction occur. Many years ago, when the "battle of the pipes" raged furiously, the old-fashioned square drains were rightly named "drains of deposit," for in their original construction they were only designed to carry off subsoil water, and no sooner were they employed to convey sewage than they broke down, became choked up, and, for such a purpose, were very properly discarded. It was confidently expected, and, indeed, still believed by some people whom no facts seem sufficient to convince, that round, and especially that egg-shaped sewers would in all cases be self-cleansing. But as regards towns, we find that even the best-constructed sewers often become "drains of deposit," and any one who reflects on the matter will easily see how this may happen. Any inequality, however slight, on the inside of the invert, or an abrupt turn in a drain, will cause a deposit which, when once begun, increases with great rapidity. Again, foreign bodies occasionally find their way into sewers, and become a nucleus round which all the suspended matters gather, and speedily form a large deposit in the sewer, and when the flow of the sewage is sluggish, it does not require a large or heavy body to cause this obstruction. If a deposit, from whatever cause, once forms in a sewer, it is very difficult to remove it by mere flushing —water has little power to do so—it must be got quit of by mechanical means. Any one taking an interest in this question, and watching carefully the proceedings of the sewer-men, must often have seen them bring up many a bucketful of black, offensive matter through the man-hole of town sewers. The conclusion I have arrived at after years of observation is, that even with the most skilful engineering and most careful inspection, it is almost impossible in towns of any size to construct sewers that shall be self-cleansing. I find that they easily silt up from deposit of suspended matter, which is much facilitated by any unevenness in the invert or joints, or the lodgment of any foreign body. A still greater objection to the modern system of town sewers is, that they are expected to serve two incompatible purposes, viz., to carry off surface and domestic water mixed with organic and inorganic refuse, and also to drain the ground by taking away the subsoil water. No one doubts that the drainage of the subsoil has a most important bearing on the health of the community, and is a most desirable improvement as regards all ground on which dwellings are to be built, while it is equally true that the removal of all organic matter before it can decompose is an absolute necessity for the health of a town population;[1] but it is altogether another matter to attempt to do so together, and by the same system of carriers. Yet, with one or two exceptions, this is what the modern system of sewers is expected to effect. If a sewer drains the subsoil, it must either be formed of porous material or have pervious joints, and it follows that if it will admit water from without, it must also allow fluid to escape from within; or, in other words, if sewers admit subsoil water, they will also allow sewage to pass into the subsoil, thus poisoning the land in the neighbourhood and polluting the wells. There can be no doubt that the removal of subsoil water is a great sanitary benefit, but it ought not to be obtained at such a probable risk.[2]

Attempts have been made to remedy this difficulty by providing a separate drain for the subsoil water, and I may mention an ingenious arrangement on a small scale for this purpose called "Brookes's patent," in which both the subsoil drains and the sewage drains are cast in the same block of fireclay. The lower part is for the subsoil water, and the joinings are left open; the upper part, for the domestic drainage, is circular, and the joinings are most carefully closed. The tendency to silt up in sewers is much increased by the detritus from the roadways and streets, and this will vary in different towns. It will be greatest from Macadamized roads, and even in these the amount will vary according to the kind of stone used, being greatest where the stone is soft and friable, and least where it is hard. In towns paved with whinstone or granite in blocks this will be less, and least in towns paved with wood. Again, the amount of detritus passing into the sewers will vary in proportion to the rainfall. The streets are at all times being worn down by traffic, but it is only during and after rain that the result finds its way into the sewers in the form of liquid mud, this process being greatly facilitated by the brooms of the street-cleaners, to save themselves the trouble of carting it away. In some towns an attempt is made to diminish the amount of suspended matter passing into the sewers by catch-pits, which do catch a considerable portion, but the rush of storm water is often so great that even where these are used a large quantity of suspended matter is carried into the sewers. Ventilation of sewers has been much insisted on lately, but in most of the proposed plans the result is not ventilation strictly so called, but merely dilution. The true definition of ventilation is the removal of foul air, and replacing it by fresh air, and no system deserves the name of ventilation which does not fulfil both of these requirements. About ten years ago I proposed to ventilate the sewers by connecting them either with the chimneys or the fires under the boilers of public works. This was a much-cherished idea of mine, only abandoned after experience, observation, and reflection convinced me of its inutility. One fatal objection I may mention, viz., that the air would be drawn not from the whole length of the sewer,

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[1] I doubt very much if any system of water-carriage can remove excreta before it decomposes, but shall enter more fully into the consideration of this subject when I come to treat of the influence of the present system on health.

[2] It may be said that if merely the upper part of the joints of drains are left open, that there would be less danger of the escape of sewage; and this might be true as regards liquid, but would have no effect in preventing the gaseous matter, which is always passing from decomposing sewage, from escaping, and being equally injurious. In further proof of the difficulty of making sewers water-tight, I refer my readers to Parke's *Hygiene*, last edition, and especially to Mr Bailey Denton's work on *Sanitary Engineering*, from page 164 of which I quote:—"When Professor Pettinkofer declared that waterproof sewers exist only in the imagination of those theorists who consider the hydraulic line and waterproof to mean the same thing," he stated "that the quantity of nitrogenous matter that escaped out of the sewers by the same apertures that admitted the subsoil water into them was so great, that in one cubic foot the quantity of organic nitrogen amounted to 122 grains. Does not this illustration of the evils of faulty sewers point out to the engineer the advantage of doing all that can be done to render sewers water-tight, and to a great extent explain the foul condition of the soil beneath our public offices in Whitehall, of which much has been recently said? It is because it is impossible to render sewers altogether water-tight when laid in wet ground that the engineer should provide in his sewers for a certain dilution by subsoil water, the exact quantity being determined by the circumstances of each case." To show the ratio of water

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supply and discharge by sewers, Mr Denton gives the following table from the second Report of the Sewage Committee of the British Association :—

Name of Town.	Water Supply.	Discharge of Sewers in ordinary dry weather.
	Gallons.	Gallons.
Glasgow..................	21,600,000	35,000,000
Liverpool................	12,750,000	25,000,000
Dover....................	1,038,740	3,438,740
Cardiff..................	1,000,000	2,500,000
Leicester................	1,780,000	3,000,000
Torquay..................	610,000	1,600,000

The above table gives the total average water-supply and the total ordinary dry-weather outflow from the sewers (exclusive of storm water). The excess of discharge over water-supply is the amount of subsoil water removed but from the open air through the opening in the sewer nearest to the chimney or fire. In order to make such a system effective to ventilate a whole sewer, provision would have to be made that every street gully, every rain waterpipe, all kitchen or wash-house sinks, as well as all drains from houses, must be trapped, and the trap be of sufficient depth and strength to resist suction from the fire or chimney. Provision would also have to be made at the opposite end of the sewer for the admission of fresh air.

As we have already remarked, no sewer can be ventilated unless there is the complete and continuous expulsion of foul air by the free and constant admission of fresh air. Openings into the streets will simply produce dilution, and any air that escapes must either be from tension or the natural law of the interchange of gases first noticed by Professor Graham. Even if sewers could be ventilated easily and completely, would the gain be great to the community? We know that sewer air is deficient in oxygen which has been reduced by the oxidation of organic matter; we also know that ozone is not to be found in the centre of towns, and possibly this more subtle form of oxygen is destroyed before the more substantial is interfered with. We should be careful not to add to the burdens of the vital air of towns, already so heavily drawn upon by their inhabitants, as well as by every fire and jet of gas. It may seem exaggeration to say that every particle of organic matter which is left in a state of putrefaction in a town is an evil, because robbing the air of a portion of its vital constituent; and yet I believe this assertion scientifically correct. I have already affirmed that the nature of the fluid to be dealt with was neither investigated nor understood before the means for the mechanical conveyance of sewage were designed. This appears very plainly when we come to consider the mode in which, until a comparatively recent date, it was ultimately disposed of, viz., to pass it at once into the sea or a river.

The delusion (I can use no milder term) was, that to get the offensive matter out of sight was all that was required, and it is only now dawning on the minds of some engaged in the study of this question, that the present system is simply one of shunting—it removes a nuisance from one door only to deposit it at another. If the matters contained in cesspools and privies had been submitted to experiment before Acts were passed compelling the discharge of these into the sewers, it would have been found that if the bowel and kidney secretions were kept separate, a considerable time would elapse before decomposition took place. If they are mixed this process is facilitated, and much accelerated if water be added, while by conveying such a mixture in close carriers, with a limited supply of air, putrefaction goes on very rapidly. Again, in utter disregard of natural laws, it was supposed that as soon as sewage was poured into a river there was an end of it, without any investigation having been made as to what effect on the river the addition of so much offensive matter would have,—though I think that few people will now deny that it has been most disastrous. No doubt chemical works are blamed for a large amount of river pollution, and certainly they should be prohibited from discharging refuse into streams, but I still think that in the majority of cases of river pollution the offensive matter is organic. In a few cases the refuse may come from public works—such as paper or tan works, breweries, etc., but, as I have already remarked, in the majority of cases it is from the organic refuse of the inhabitants and their domestic animals. I may illustrate my meaning by considering shortly the state of three rivers. Before the excreta of London was passed into the Thames that river remained comparatively pure, but after that date it became frightfully offensive, and no increase of chemical or other works could account for this rapid change. Again, the Clyde was sufficiently pure to allow of salmon being caught in the immediate vicinity of Glasgow until the domestic sewage of that city was passed into it. But probably a still better illustration is the river Tyne. Ten years ago, in passing from Carlisle to Newcastle, I observed a little below Hexham that salmon-fishing was going on, and could not resist an involuntary exclamation of surprise at the sight. The only other occupant of the carriage happened to be the chairman of the conservators of the river, who, seeing that I was much astonished, kindly afforded me much interesting information. He said he had no fear as to the fish getting up the river; he said they did so quite freely through all the refuse from the chemical works which abound on both its banks from Shields to Newcastle. Dr Angus Smith told me, that at that time 45 per cent. of all the alkali made in Britain was manufactured on the Tyne, and that the refuse was passed into the river in a more acid state than elsewhere. In the case of the Thames we find the river pure until used as a receptacle and carrier of domestic drainage. On the Clyde we find chemical works, but the river not offensive until domestic sewage is added. In the Tyne we find much *chemical* refuse, but the river remains inoffensive. No doubt stream or river water, as ordinarily met with, can oxidize a certain amount of organic matter; but this action takes place not from the water itself, but from the small quantity of air dissolved in it; therefore a rapid brawling stream, dashing over rocks and boulders, will oxidize a considerable amount of matter as it is rapidly reaërated. A deep, slow flowing river, however, will have but little of this action, and as towns are generally built on their banks, where they are both broad and deep, the passing of sewage into such rivers in or near the towns runs the risk of converting the lower part of the stream into an elongated open sewer or cesspool. Even in the mere mechanical mode of discharging sewage into rivers, serious mistakes are made. It is quite common to lay the discharge pipe under water, so that the discharging end of the pipe is sealed by the water, and from this two evils will arise—first, a tendency to deposit the suspended matter, and second, the inevitable forcing back of the sewer air into the house, if no provision has been made for its escape from the sewer into the open air. These evils will, of course, be increased twice a day if the exit sewer opens into a tidal river. If a river is in flood, the sewage may thus be dammed back for several days. I once saw an epidemic of typhoid from this cause in a well-built and favourite suburb of a city. The river passing it was in flood for some weeks, and the result was not merely an outbreak of typhoid and diphtheria, but other diseases, especially erysipelas, assumed a malignant type. Wherever a sewer discharges into a river there is a deposit, and a danger of the bed of the stream being silted up. In proof of this I shall quote from Captain Calver's report in October last as to the state of the Thames. He says "that accretions have recently formed within the channel of the Thames; that a material portion of these are in the neighbourhood of the sewage outfalls, and have formed since the outfalls came into operation; that the constituents of these accretions are the same as those of the sewage, and that the latter is discharged in sufficient quantity to account for them, the character of the tidal streams in the neighbourhood of the outfalls as to direction and force being the effective cause of the accumulation." He further expresses the opinion "that the increase of soil in Woolwich Beach and elsewhere above the outfalls has been derived from the sewage discharge, and that the operation of accretion has been effected by the superior disturbing and transporting power of the flood-stream, aided by the peculiar character of the suspended material."[1] When sewage is passed directly into the sea, the result is not quite satisfactory; silting up takes place, although probably to a less degree than in rivers, and as the salt water is specifically heavier than the sewage the latter floats, and may be carried to other shores, and so cause a nuisance. Moreover, the salt exercises a kind of preserving influence on the organic matter and retards its oxidization, and this, so far from diminishing, rather increases the smell from that process. Again, the pollution of rivers has seriously affected the water-supply. Until the sewage of towns was run into the rivers, they could, unless injured by chemicals and other works, supply water to the inhabitants of towns on their banks. Now, water-supply has to be sought for at great distances. Hitherto I have been considering the injury to towns occasioned by the mode in which excretal matter is disposed of, but villages and detached houses suffer equally. In the former, any tumble-down old outhouse behind the cottages is considered quite good enough for the "convenience." No care whatever is taken to make the receptacle water-tight, the result is that the surrounding soil becomes saturated, and by soak-age the offensive matter travels long distances and the wells become polluted.[1]

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[1] The *Medical Press and Circular*, 19th June, p. 512.

I have by means of Nessler's solution tested a large number of wells in villages and detached country-houses, and in a very large number of cases have detected organic impurity, of which I shall give but one example. Some years ago, in the autumn, when families return from their summer sojourn at one or other of the beautiful watering-places on the Clyde, I saw two families (one that of a medical friend) in which there were several cases of typhoid, one in each family being very severe. I found that both families had been at the same place, and on investigation, it became quite clear that there they had received the poison. This was confirmed by the fact that fever and diphtheria prevailed in the place. Finding that the town, although containing between three and four thousand inhabitants, was still dependent upon wells for its water supply, I obtained from one of the parties samples of the wells, to the number of twenty-eight. I tested the whole of these, and noted the degree of impurity in each, and it was very curious to see how the degree of pollution corresponded with the prevalence of disease. As I read over the list, in coming to a very bad sample, I was met by the remark that there had been typhoid or diphtheria, as the case might be, amongst the people using that well; but of the whole twenty-eight wells, only one was found to be free from organic contamination, and that one was at a considerable distance. For many years I have warned families going out of town, that previous to taking coast or country houses supplied by wells, that the water ought to be tested by Nessler's solution, and if it indicates organic pollution, the water ought then to be analyzed. I may add this caution, that it is always better to distil the suspected water; the ammonia will, of course, come over with the water, and iron, salts, etc., will be left behind.

In the next paper I shall take into consideration some of the plans that have been proposed for the utilization and purification of sewage.

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[1] Water contaminated by sewage is not, unless the organic matter is very great, disagreeable to the taste; indeed, it is often cool and sparkling, which a very little reflection will explain. Sewage matter, as it decomposes, gives off carbonic acid, which gives the sparkling appearance, while at the same time nitrates are produced which cause a sense of coolness to the palate.

(*To be continued.*)

Part Second.

REVIEWS.

Morbid Craving for Morphia. (*Die Morphiumsucht*) *A Monograph founded on Personal Observations.* By EDWARD LEVINSTEIN, M.D., Medical Director of the Maison De Santé, Schöreberg-Berlin. Translated from the German by CHARLES HARRER, M.D., L.R.C.P. London, Physician to the Eastern Dispensary of the German Hospital in London. Pp. 131. Smith, Elder, & Co.: 1878.

THE scope of the work, as the author tells us in his preface, is limited, its object being to clearly demonstrate the ill effects which continued injections of morphia have upon the human body (we may add, and mind); to show the dangers threatening society by such a continuous use of the drug; and to point out the remedies for the redress of this abuse. Both the author and his translator have done their parts well, and have made a valuable contribution at once to therapeutic knowledge and to social welfare. We were hardly prepared for the information that the use of morphia by subcutaneous injection was carried to such an alarming extent in Germany,—we hope things are different in our own country—not by authorized practitioners, but by patients—not for the simple allaying of pain, but to lull mental worries and anxieties, and to gratify a sensual craving. Of course, in most cases, the habit originates in the successful relief of physical pain; still, there is reason to fear, that not a few victims have been led to adopt it without so good a reason, and have gradually—in some cases sooner, in others later—become its abject slaves. The doses administered in this way seem almost incredible, both as to size and frequency. Six, eight, ten, twelve, sixteen grains are mentioned as no extraordinary allowance daily; and one case is narrated in which the patient, an officer in the army, injected himself thirty times in the twenty-four hours. The question naturally arises: Would it not be easier for such a patient to swallow a corresponding quantity of the drug than to subject himself to so many operations, in themselves not without pain, and, when multiplied, likely to cause local irritation. Various reasons for preferring the injection may occur. Probably the true one is that the habit commenced with the treatment of a localized pain, and so was not unnaturally persevered in. Fashion, springing out of popular talk, may also be credited in some measure with the result.

The symptoms of chronic-morphia poisoning are depicted forcibly. The evil consequences arising from the abuse of injections generally begin to appear after a period of four to six months; but there are cases in which these are deferred for years. "Many people afflicted with morbid craving for morphia feel quite well for a certain time whilst using the narcotic; no disturbances are felt, the appetite, and even the bodily weight remains unaltered, while others become emaciated. Soon, however, a series of morbid appearances show themselves, originating in the cerebro-spinal and sympathetic nervous system. The different organs are affected in various ways: some are not implicated at all; in others, one distinct symptom predominates over the rest to such an extent as to be the chief cause of the patient's complaints." "The eyes are often devoid of lustre, the patient's glance is weak, miserable, and shy; after administering a new injection, however, they become animated, passionate, or enthusiastic. Double vision and a diminished power of accommodation are not rarely met with. The pupils are generally contracted, frequently disproportionate, rarely enlarged." Other symptoms affecting the stomach, the circulation, the kidneys, the organs of generation, the central nervous system, are described at considerable length.

The symptoms caused by abstinence from morphia are very dreadful and may be quoted. "Only a few hours have passed since using the last injection of morphia, and already the feeling of comfort brought on by the action of the drug is passing off. The patient is overcome by a feeling of uneasiness and listlessness; the feeling of self-consciousness and self-possession is gone, and is replaced by extreme despondency; a slight cough gradually brings on dyspnœa, which is increased by want of sleep and by hallucinations. The vaso-motor system shows its weakness by abundant perspiration, by the dark colour of the face, which replaces the pale condition apparent during the first few days. Flow of blood to the head and palpitation of the heart with a hard pulse soon show themselves. The latter symptom often disappears suddenly, and is replaced by a slow, irregular, thread-like pulse, which is the sign of the beginning of a severe collapse. The reflex irritability increases; the patients begin to sneeze, and have paroxysms of yawning; they start if any one approaches them; touching their skin causes cramping movements or convulsions; the trembling of the hands, if not already evident, now becomes distinctly perceptible. The power of speech is disordered; lisping and stammering take place. Diplopia and disorders of the power of accommodation, frequently accompanied by increased secretion of the lachrymal glands, show themselves. The patients are overcome by a feeling of weakness and total want of energy, and are thus compelled to lie in bed. Neuralgic affections of various parts of the body, pain in the front and back of the head, cardialgia, abnormal sensations in the legs, associated with salivation, coryza, nausea, vomiting and diarrhœa, tend to bring them into a desperate condition. Some persons will bear up with fortitude under all these trials; they will quietly remain in bed and endure the unavoidable suffering, hardly uttering a complaint. Of the others, although the great minority of them sleep and dose during this trying time, some can find rest nowhere; they jump out of bed, run about the room in a state of fear, crying and shrieking. Gradually they become calmer, although, occasionally, their excitement increases. A state of frenzy, brought on by hallucinations and illusions of all the senses, at last causes a morbid condition to which I have given the name of *delirium tremens*, resulting from morbid craving for morphia, it being similar to that caused by alcohol. Some of the patients, however, will be found walking about in deep despair, hoping to find an opportunity of freeing themselves for ever from their wretched condition." A number of graphic cases are given, to which we refer our readers.

It is noteworthy that the symptoms brought on by the abuse of morphia coincide strikingly with the pathological conditions for which the drug is therapeutically administered. Sleeplessness, hyperæsthesia, neuralgic complaints, mental anxiety, depression and excitement are all combated as well as created by morphia. Let it be noted, also, that the principal symptoms showing themselves in people suffering from morbid craving for morphia, during the period of abstinence, are soon removed, for the time being, by the use of morphia.

We may mention here that numerous experiments were performed by Dr Levinstein on pigeons, on pregnant rabbits, on pregnant dogs, on rabbits and dogs not pregnant, with the view of illustrating the general effects of morphia on the animal system, and its special action on the generative and urinary organs. It appears to us that much unnecessary suffering on the animals thus subjected to experiment was inflicted without any corresponding advantage, without any reliable addition to our knowledge.

We have already mentioned that among other deleterious consequences of excessive use of morphia, impotence in the male, and amenorrhœa and sterility, or proneness to miscarry, in the female, are generally met with. The urine is usually albuminous, and, in fatal cases, the presence of sugar indicates an affection of the *medulla oblongata.*

In the treatment of cases in which a morbid craving for morphia has become incontrollable, Levinstein, whose experience has been extensive, gives a decided preference to the sudden and complete deprivation of the drug to a slow and gradual deprivation. We think that he makes out his case; but our space forbids us to enlarge.

As every one must see, great firmness and courage are required in the physician who undertakes such formidable cases. Sometimes there is real danger from *collapse;* although to ascertain its presence demands much attention and discrimination, as it may be simulated. When it threatens, Dr Levinstein finds that a small quantity (half a grain) of morphia injected will usually avert the danger. If, in ten minutes, the pulse and general condition do not improve, the injection may be repeated once or twice, until the return of the normal condition is evident. "At the same time the patient is to be kept awake by counter-irritation, smelling salts, cold compression on the head, dropping ether on the skull, by talking loud to him and shaking him; and stimulants, such as liquor ammoniæ, champagne, port-wine, brandy, hot coffee or tea with rum, are to be given internally."

"It is worth noticing that injections of morphia administered during the collapse do not prolong the time of the severe symptoms of abstinence."

A process is given—that of Professor Dragendorff—by which morphia is readily detected in the urine. This is important with reference to the following observations: "In cases of morbid craving for morphia, the evacuation is not very rapid, as the urine contains morphia for six or eight days after the commencement of the abstinence. A patient, whose urine contains morphia for a longer period than six or eight days, *is sure to be continuing the injections of morphia, although he may positively deny the fact.*" The same sad demoralization which is met with in drunkards exists in the slaves of morphia.

We regard this as a valuable work, and recommend it heartily to our readers.

Although subcutaneous injection, like every other benefit, is liable to abuse, no unprejudiced mind will deny that the invention of our distinguished townsman, Dr Alexander Wood, was a very valuable addition to our therapeutic resources, and, in truth, will mark an epoch in the modern practice of medicine and surgery. We have long felt that, like other inventors deserving of cordial thanks from their fellow-men, his undisputed claims to the original idea of subcutaneous injection, and his perfect application of it, have been inadequately recognised by his contemporaries.

The Human Eye: Its Optical Construction popularly explained. By R. E. DUDGEON, M.D. London: Hardwicke and Bogue: 1878. Pp. 92.

THIS little book is the outcome of several pamphlets and lectures, and indicates much thought and deliberation. It is written clearly, tersely, precisely, and is adequately illustrated by nicely-executed drawings and diagrams.

It is well fitted to instruct all classes, but specially professional readers, whose knowledge of mathematics does not suffice for a strictly scientific study of the subjects treated. There are, at the same time, some novel views regarding *subaqueous* vision, *air* lenses and *visual accommodation*, which claim attention. A few words as to these.

We are apt to underestimate the importance to vision of what may be called the *aqueous* lens as distinct from the *crystalline*. The *aqueous* lens performs the chief refraction of rays entering the cornea, the *crystalline* being, to use the author's words, "a supplementary lens affecting a slight additional refraction of the incident rays." That the latter is not essential to vision, is proved by successful operations for cataract. But under water, the importance of the *aqueous* lens becomes obvious. A diver has little more than a perception of light and colour; he has the vaguest perception of form. What is the explanation? The refraction effected under ordinary circumstances by the *aqueous* lens is altogether and necessarily extinguished or prevented by immersion in water. Dr Dudgeon has devised a remedy for this. A powerful convex lens of glass will do it, if fixed in front of the eye; but it can be done still better and more conveniently by using the medium of a refractive power, much inferior to that of water. That medium is air. In that case, however, the lens must be a double *concave*, and not a double *convex*, as when glass is employed. This is his mode of constructing such a lens: "Take two of the old-fashioned, highly curved watch-glasses, and fixing them in a ring with the concavities outwards, you enclose a portion of air of the shape of a double concave lens. Immersed in water, this *air-lens* will refract the rays of light from objects reaching it through the water, convergently."

By getting the containing glasses ground, so that their surfaces shall have precisely the same curvature, any deflexion of the rays of light is avoided, and they not only restore perfect vision beneath the water to the diver, but offer no impediment to perfect vision when he ascends to the surface.

The concluding pages of the treatise on the subject of visual accommodation will amply repay perusal. Dr Dudgeon's view as to the attachment and functions of the ciliary muscle is ingenious; and without venturing a decided opinion on a *quæstio vexata* of such long standing, we think his idea that a forward and rotary movement is communicated by it—acting on one side, while the other side is relaxed—to the crystalline lens, helps to explain accommodation of vision for near objects.

Hôpital "Philantropie" Bucarest. Guerison de six aveugles-nes. Par. M. Le Dr Louis Fialla, Chef du Service Chirurgical a l'Hopital "Philantropie." Bucarest: 1878. Pp. 32.

THIS short *mémoire* is interesting and creditable to the author, who appears to write in a language not his own.

It contains an account of no fewer than six cases of double con-

genital cataract, in which he operated with a successful result, and watched with commendable accuracy the gradual acquisition of visual power by the individual patients. We are not sure that any new facts were observed, but the observations of former writers on the same class of cases were amply confirmed; and the whole performance indicates much intelligence and professional enthusiasm on the part of Doctor Fialla. He presents us with what he believes to be an accurate list of recorded cases of congenital cataract, beginning with Cheselden's case in 1728 and ending with that of Dr Taylor in 1876. We know of at least five additional cases, carefully described and commented on in Great Britain alone, during that period, and of recent date: one by Mr Nunneley of Leeds; one by the late Mr George Bell of Edinburgh, and three, occurring in a single family, by Mr B. Bell of this city. The last of these communications may be found in this Journal, June 1868, p. 1863.

Dr Fialla deserves credit for searching out so many as fourteen cases in addition to his own; but we doubt not numerous cases of the same kind might be found in the periodical literature of different countries, because the disease is not uncommon, and always affords an opportunity for scientific inquiry and philosophical speculation.

The Ear; Its Anatomy, Physiology, and Diseases: A Practical Treatise for the Use of Medical Students and Practitioners. By CHARLES H. BURNETT, A.M., M.D., Aural-Surgeon to the Presbyterian Hospital; Surgeon in charge of the Infirmary for Diseases of the Ear, Philadelphia. With 87 Illustrations. London: J. & A. Churchill, New Burlington Street: 1877. 8vo, pp. 616.

ON account of the great advances which have been made of late years in otology, and of the increasing interest manifested in it, the medical profession will welcome this new work, which presents clearly and concisely its present aspect, whilst clearly indicating the direction in which further researches can be most profitably carried on. Dr Burnett, from his own matured experience, and availing himself of the observations and discoveries of others, has produced a work which, as a text-book, stands *facile princeps* in our language. Our author, from considerable practice in teaching, having learned that the pathology and therapeutics of the ear cannot be properly understood without an intimate acquaintance with its anatomy and physiology, has given in the space devoted to these departments much important and sound information. In the departments of the anatomy and physiology of the ear much important work has recently been done in Germany; whilst the Americans, from German influence, are carrying on a thoroughly scientific research into all departments of medicine, otology is receiving a large share, and Dr Burnett holds no inferior position amongst a body of highly cultivated men zealously striving to master and to bring the knowledge we ought to possess of the ear before our notice. All success to all such earnest labourers in this extremely difficult, greatly neglected in the past, but supremely important, department of medicine.

We had marked several passages well worthy of quotation and the attention of the general practitioner, but their number and the space at our command forbid. Perhaps it is better, as the book ought to be in the hands of every medical student, and its study will well repay the busy practitioner in the pleasure he will derive from the agreeable style in which many otherwise dry, and mostly unknown, subjects are treated. To the specialist the work is of the highest value, and his sense of gratitude to Dr Burnett will, we hope, be proportionate to the amount of benefit he can obtain from the careful study of the book, and a constant reference to its trustworthy pages.

The Throat and its Diseases. By LENNOX BROWNE, F.R.C.S.Ed.
Baillière, Tindall, & Cox: London: 1878.

THIS, as one may judge from its title, is another work added to the already many treating of the throat and its surroundings, the author not being unknown to the profession by his papers already published in the various journals.

The somewhat large volume of over 300 pages is divided systematically into chapters, the first three of which are taken up with a description, much as usual, of the laryngoscope and how to use it, and a short, but rather sketchy account of the naked-eye anatomy of the organ made visible by its use.

The part devoted to semeiology and therapeutics of throat diseases is good.

The author's method under the former of noting the clinical facts of the cases under the two great heads, "Functional or Subjective," and "Physical or Objective symptoms," each with its various subdivisions, is excellent, and leaves little to be desired, inasmuch as the practitioner paying attention to these will omit nothing of importance in the notes taken of his cases.

Under therapeutics are contained many hints to be borne in mind by the reader, while at the same time we cannot altogether agree with the author in some things. When writing of the use of spray, etc., he considers that, from the function of the larynx being to afford passage to air, and not to liquids, the use of sprays to this part is a mistake, and he considers vapour inhalations, especially in the form of *salles d'inhalations*, the air of which is charged with clouds of very finely atonized medicated matters, as that of Vichy, etc., are much more preferable. Mr Browne thinks little of the spray gets beyond the epiglottis; but with this we cannot quite coincide, as it is not difficult to observe spray falling within the cavity of the larynx by looking into it by means of the laryngoscope, while spraying is being had recourse to; and patients accustomed to their use feel them distinctly within the same part.

Lozenges are evidently a favourite manner of prescribing various medicaments. The author recommends their being made with fruit paste, and not according to the pharmacopœial directions, as the latter are hard and not easily dissolved, while the others are so, besides being more palatable. Not having seen those recommended by Mr Browne, we cannot speak personally of their advantages, but have little doubt that the ordinary ones should not be used in quantity at least, as they are apt to upset the stomach.

The chapters on chronic pharyngitis, and also on the uvula and tonsils, are interesting.

Mr Browne excises chronically enlarged tonsils in all cases by means of a guillotine; he deprecates all other means, *e.g.*, vulsellum and knife, and finds the galvano-cautery not so good as one would imagine, its use being followed by much more pain than is excision.

Under croup in children, and when a satisfactory diagnosis cannot be made, he thinks it "may be aided by the introduction of the finger into the larynx, but such a course is rather to be deprecated, and in any case most sparingly employed"—we should also think so.

Under the head of neoplasms in the larynx, the author points out very correctly the necessity for not always removing or attempting to remove simple or non-malignant polypi, explaining how much injury to the parts is often done, not always without grave danger to the patient, and not by any means ensuring a future freedom from the growth.

He lays great stress upon the frequence of catarrhal conditions in the cavity of the larynx, and the presence of new growths, as cause and effect, and urges the early treatment of the hyperæmia, so as to avoid, in many cases at least, the formation of the growth.

The final chapter is a short one on neurosis of the larynx.

To the end of this work is given a list of formulæ for remedies in use by the author in treating laryngeal cases. There is also a pretty complete bibliography of systematic works of reference on throat diseases, English, French, German, and Italian.

Woodcuts are freely interspersed throughout its pages; and lastly, we would draw attention to the coloured plates, 100 in number, the majority of which are excellent and most artistic; so arranged that the page on which any set are may be exposed to view while the reader is perusing the letterpress in the book of the volume referring to them—a most excellent arrangement.

We can heartily recommend this work to the medical reader; it is well printed, in clear type, handsomely got up, and does credit to both author and publisher.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania, etc. Philadelphia: J. B. Lippincott and Co. Parts I., II., III. 1876–77–78.

DR DUHRING is known as an energetic worker in the department of dermatology, and as the author of the most recent, and one of the most useful, treatises on diseases of the skin in the English language, which was reviewed only a few months ago in these pages. Excellent as his systematic work is, we anticipate even a more favourable reception for his Atlas. In planning the latter he has proceeded on the only true basis on which an atlas of skin diseases can be satisfactorily constructed, viz., by selecting a typical example of the condition under examination in a fully developed stage, and then as accurately as possible transferring its features to paper on a sufficiently large scale to enable these to be clearly seen. It is, we maintain, a faulty mode to attempt to show in one drawing various stages of the same lesion, for in doing so we pervert nature, and in most instances produce a monstrosity. Infinite as are the variations under which skin diseases manifest themselves, there are certain cardinal points of distinction never entirely absent, and the skill of the delineator is shown in giving these their due prominence. In this particular the twelve plates included in the three fasciculi already published are all eminently happy, and compare very favourably with other recent atlases.

Eczema in its erythematous and squamous forms takes up two of these, and no representations could be more life-like. The squamous is shown in a common and obstinate situation, the nape of the neck.

Lupus erythematosus forms the subject of another plate, and its peculiar and characteristic features are unmistakably portrayed.

Acne rosacea, ichthyosis simplex, and purpura simplex are all equally well depicted, and the same may be said of tinea versicolor, which is shown both in its most frequent situation, the front of the chest, and as assuming its most usual hue, that in which it simulates chloasma. The non-parasitic variety of sycosis is more faithfully reproduced than we remember to have seen it, the characters distinguishing it from eczema of the beard being well seen.

Perhaps the only plate which to our mind is not thoroughly satisfactory, is that of psoriasis; it is almost impossible to give the pearly hue of the scales on paper. It is, however, a disease which can scarcely be mistaken, except in its very earliest stage, when only a few red or very slightly scaly papules constitute the entire lesion. We think an illustration of psoriasis just beginning would have been more valuable as an aid to diagnosis than when fully developed as here.

The syphilo-dermata are exhibited under the erythematous, small papular, and pustular, and large pustular forms, for the Atlas is not limited to skin diseases proper, but includes these, and its value is correspondingly enhanced.

Each plate is accompanied by appropriate letterpress, which, after an account of the special case selected for illustration, sketches clearly and tersely the symptoms and morbid anatomy of the disease, and concludes with some short and practical remarks on treatment.

The get-up, so to speak, is admirable, and if the succeeding parts, which are promised in future to appear without undue delay, maintain the same excellence, Dr Duhring will have earned the warm thanks of the profession generally. We anticipate a wide sale for his Atlas, and cordially wish it success.

Atlas of the Diseases of the Skin. Part I. By BALMANNO SQUIRE, M.B., Surgeon to the British Hospital for Diseases of the Skin. London: J. & A. Churchill: 1878.

SKIN diseases are attracting deservedly more attention than of yore, and the multiplicity of illustrative representations of their forms is the result of this. Mr Squire has attempted an innovation in his new Atlas, or rather text-book, on the subject with coloured plates, since we have four plates and eighty-nine pages of description. The innovation consists in reducing the size of the paper to octavo, while the affected portion which is reproduced is drawn nearly life size. Mr Squire claims the greater handiness of such a volume as a set-off against the necessarily limited area of surface depicted. We are not sure this is an advantage.

The two first plates are devoted to port-wine mark, and are good pictures of this not uncommon and disfiguring condition as seen on the face—a situation for which it has an unfortunate predilection. A monograph on the affection accompanies these, and contains an account of Mr Squire's plan of treating it by multiple scarifications —a development of Volkmann's mode of treating lupus, though we do not find any reference to Volkmann in the article.

The third plate is said to be psoriasis on the face in a patient who had previously suffered from ophthalmia tarsi. It is not nearly so well executed as the preceding one, and apparently exhibits that form described by M'Call Anderson as psoriasis rupioides, which Fox has pointed out is psoriasis modified by struma, the layers of scales containing pus. The last plate depicts the same patient when cured—in fact, a healthy face; this teaches nothing, as psoriasis is known to leave no permanent scarring. It would have been much better to have shown the results of Mr Squire's treatment of nævus, as, if it is as satisfactory as its author declares it is, it might have been usefully employed in encouragin those afflicted with vascular mother's marks to submit to a tediou operation.

The article on psoriasis is well written, and is full of all th various modes of removing it, preference being shown for loca rather than internal remedies. We hope Mr Squire will b encouraged to go on with his Atlas, which may be made a valuabl compendium of cutaneous medicine.

Brain: a Journal of Neurology. London, April 1878.

The Journal of Psychological Medicine and Mental Pathology. Nev Series, Vol. IV. Part I. London, 1878.

CLEARLY there is no lack, in our language, of periodicals whicl treat of neurology and diseases of the nervous system. There i the *Journal of Mental Science*, the *Journal of Psychologica Medicine*, and in America the *Journal of Nervous and Menta Diseases*, renowned for its *résumés*, reproductions, and translations the *American Journal of Insanity*, and the *American Psychologica Journal;* but if the projectors can find a publisher the publi need not complain, as an excess in production never injures th consumers. Writers do not seem to fail, and we hope that readers will not be wanting. *Brain: a Journal of Neurology*, is th newest candidate for public favour. It is sustained by fou editors, Drs J. C. Bucknill, J. Crichton Browne, D. Ferrier, J. Hughlings-Jackson, names all well known and eminent in neurology. The first number is conducted on much the same plan as the *Berlin Archiv für Psychiatrie*, the articles are scientific and medical, without a ballast of news or talk about asylum matters. It contains 142 pages, 100 of which are given to original articles, and the remainder to critical digests and notices of books, reports of clinical cases, and abstracts of British and foreign journals. The first article is, "On the Symptom Significance of different States of the Pupil," by Jonathan Hutchinson, F.R.C.S. The conclusion one derives from reading it is that the actions, inactions, and symmetry of the pupils rather indicate changes in the irido-motor nerves and articular ganglion, than in the nervous centres. The paper, obviously written by one who has thoughtfully studied the subject, is not completed. For the second article Mr G. H. Lewes has a disputation "On Motor Feelings and the Muscular Sense," at the end of which he tells us that "we have the same ground for including the motor nerves among the *essential conditions* of productions of muscular sensations, as for including the optic and auditory nerves among the essential conditions of production of sight and sound sensations." To our mind Mr Lewes has not made the matter so clear. Some of his facts are questionable, and much of his reasoning and guessing is wide of the mark. It is not worth while discussing his theory of a recurrent "wave" of the "semi-liquid axis cylinder" of the motor nerves after the contraction of a muscle which, as he tells us, he was the first to suggest, and which he will possibly be the last to foster; but we do not admit his assertion, that a frog without its brain and without its skin exhibits the same co-ordination of a complex order as a frog intact; and if it did so, are we to believe that co-ordinations in a frog indicate a muscular sense in the spinal cord? Or is it safe to reason from what is observed after braining or skinning such a creature, in order to support theories about the human "sensorium?" A frog deprived of the cerebrum retains co-ordinating power; but if the optic lobes be taken away, or if the skin of the legs be stripped away, it loses this power. In the convergence and divergence of the eyes we have the shifting of the retinal image to warn us that the globe is being moved, and in using the muscles of voice we have the ear to correct the execution of sounds, and Mr Lewes himself tells us that the deaf man, no longer rightly informed of the effect of the sound which he utters, finally loses the power of speech; yet he somewhat inconsistently writes that the movements of the eyes, tongue, and glottis are learned through the muscular feelings. We do not take upon us to deny the existence of the muscular sense; but if the recognition of realized voluntary motions be not entirely dependent upon the sense of movement, feeling, and displacement in the nerves of the skin, fascia, periosteum, and articulations, there is no question that a good share of such recognition is due to these sentient nerves. The next article is on the "*Rôle* of the Dura Mater and its Nerves in Cerebral Traumatism," by H. Duret. He shows that the dura mater contains sensory nerves eminently excitable, whose irritation causes pain, hyperæsthesia, reflex motor actions, spasms, and contractions of the muscles of animal and organic life.

There is a very laborious paper on the "Comparative Structure of the Cortex Cerebri," by Mr Bevan Lewis. The remaining articles are, "On some Symptoms of Organic Brain Disease," by Dr W. R. Gowers, "On Brain Forcing," by Dr Clifford Albutt, the old controversy between the schoolmaster and the physician, and on "Skull Mapping," by Mr Crochley Clapham.

The original articles well bear up the character of a first-class scientific periodical, and the reviews, abstracts, and clinical cases show both knowledge, judgment, and literary skill.

The *Journal of Mental Science* has, especially in the reviews, a pronounced leaning to the materialistic side, nevertheless, it freely admits articles of all tendencies of opinion, as becomes the organ of the Medico-Psychological Association. On the other hand, the *Journal of Psychological Medicine* takes the place of Defender of the Faith against Materialism and Darwinism. Dr Winn appears in the van with his article on Pseudo-Philosophy. The combat of religion and materialism has gone on for thousands of years, and is not likely to be soon closed. It is whimsical to observe how eagerly Dr Winn quotes "authorities" on his side, and depreciates his adversaries with blunt personalities. Though disliking materialism, we are somewhat doubtful of the wisdom of thus mixing science and theology in journals professedly set apart for the former. There is a paper designed to prove palæolithic man to be "a myth of the present," which is quite beyond the scope of psychological medicine, and some of the reviews might be well placed in a religious periodical.

The articles in general are well written, and Dr Rorie's analysis of the evidence of the Dillwyn Committee should be especially interesting in Scotland. Dr Rorie handles his subject with the close grasp of a lawyer, as well as with the ripe knowledge of an experienced alienist physician.

There is also an article on Athetosis, by Mr A. C. Munro, from cases in the Southern County Asylum. We have seen this symptom both in asylums and out of them, and doubt whether it ought to be erected into a special disease. It consists mainly in an inability to retain the fingers in a proper position, and so many cases have now been published, that we fear some writers in medical journals have got the disorder.

Lunacy in its Relation to the State. By Sir JAMES COXE, M.D., F.R.S.E., Commissioner in Lunacy, Scotland. London, 1878.

WE had intended to consider this pamphlet along with the Parliamentary Report of the Select Committee of the House of Commons appointed to inquire into the operations of the Lunacy Laws; but the recent death of the author has made us alter our purpose. In writing criticisms and discussing important views, personal feelings should, as far as possible, be absent. When a life work is ended, one feels a stronger inclination to view it as a whole than to examine any part of it. As the senior Commissioner in Lunacy, Sir James Coxe's influence was great, and was steadily exerted in promoting the welfare of the insane. In doing so, he was guided by a few broad principles, which he steadily and consistently applied. These he had no doubt learned in youth from his uncles, Dr Andrew Combe, the well-known writer on physiology and hygiene, and Mr George Combe, the author of the *Constitution of Man.* Apparently his mind was of a class which suited such teaching; he had what the French call *l'esprit positif.* The well-known views, repeated so often in the yearly Reports of the Board of Lunacy, set forth a few years ago in his address as President of the Medical Psychological Association, and recently stated before the Dillwyn Committee, appear again in this pamphlet. "Maintain the health of the body, and give adequate exercise to all its organs, and you will do the utmost that man can do to secure the health of the mind." Sir James was no believer in medical treatment in insanity, and his scepticism on this point sometimes aroused hostility; but he had a great faith in the doctrines of preventive medicine. He was a persistent advocate for physical training, and for teaching every man to be the guardian of his own health, by imparting a knowledge of the functions of the human body, and the conditions under which health is best maintained. Whatever might be the reasons which induced a man of his eminent position and experience to publish so short a work, there is no evidence in it of exhaustion or decay—none even of the diffuseness which generally marks the writings of old men. He passes rapidly over a number of difficult and debateable subjects with a firm and equable tread, the general result being an entertaining and instructive pamphlet. He shows the difference between the English and Scotch Lunacy Boards, and the English and the Scotch forms and methods of detention, and suggests a few amendments. In common with all who have paid any attention to the matter, he comes to the conclusion that "there is no great reason to fear that persons of sound mind are ever sent to asylums;" but he adds, "it is not so clear that detention in asylums is not, in many cases, prolonged after the necessity for this course has passed away." In the nature of things, this could never be made so clear. There are always in asylums a number of people who are really sane, and whom the medical superintendent would dismiss at once if he knew that the recovery would last, or would stand the trial of the outer world. It must be remembered that the responsibility of the superintendent does not exactly cease when the patient has passed through the asylum gates. What if the discharged patient commits suicide, or does some act of violence or extravagance shortly after his dismissal? In judging on so difficult a question, it is possible that mistakes may now and then be made; but there was no evidence brought before the Dillwyn Committee that the superintendents, whether of public or of private asylums, were ever influenced by any other motives than the welfare of their patients. This being so, it follows that there is no ground for increased restrictions upon the powers intrusted to those in charge of the insane, and no need for increased complexity or difficulty in the forms of detention. Sir James Coxe would have an exhaustive inquiry into the whole administration of lunacy by a Royal Commission. "We want," he observes, "more information as to the action of the parliamentary grant for the maintenance of pauper lunatics, in fostering the increase of their numbers; for it is a mistake to hold that it has no influence in this direction. It may have no operation in the production of lunacy, but it has been found by experience to exert a positive action on the numbers of the insane who are thrown upon the rates. It is always difficult to withdraw assistance of this kind when once it has been conceded; but the inducement which the grant holds out to include among lunatics every person who can by any possibility be certified to be of unsound mind, might be neutralized by placing it on a permanent basis—that is, by fixing the allowance to each parish or union according to a past average, and leaving it uninfluenced by any future increment of the numbers, at least until such time as strong reasons should appear for its revision."

We have little doubt that Sir James knew how this inquiry would terminate, and that if the decision had been left to himself he would have proposed the entire abolition of the parliamentary grant for pauper lunatics. He proposes that there should be further investigation into the manner in which the estates of lunatics are administered by the Court of Chancery, and that the certificates of insanity granted for one kingdom should be valid for both. He also thinks that it should be clearly defined whether in giving his order the sheriff in Scotland acts in a judicial or simply in a ministerial capacity, and whether the superintendent of the asylum ought to satisfy himself that the medical certificates afford adequate proof of insanity, and are in harmony with the provisions of the Lunacy Acts. None of these amendments are urged in a manner which would lead one to suppose that the author believed that there was any great need of immediate changes in the Lunacy Acts, and the general tone is one of satisfaction with their working.

On the Treatment of Wounds: Clinical Lectures. By SAMPSON GAMGEE, F.R.S.E., Surgeon to Queen's Hospital, Birmingham; with Engravings on Wood. London: J. and A. Churchill: 1878. Pp. 160.

WHATEVER Mr Gamgee writes is sure to be interesting, his strong individuality shows itself in every case, in every illustration, almost in every line.

As to whether this book is to be considered a success or not, will depend much on what its real aim is, and that is not so easy to detect as might be expected. As teaching for students in the first principles of surgical treatment, we find in its pages many excellent generalizations, many practical hints of great value; but if intended as a deliberate and closely-reasoned contribution to the *science* as apart from the *art* of healing, we are somewhat disappointed.

The first lecture, while relating some capital cases, merely teaches that clean cuts heal quickly under dry lint and gentle compression. The second is a curious bundle of scraps on the subject of arrest of hæmorrhage, including an utterly irrelevant letter (date

1862) from the late Professor Syme on ligature of the femoral artery, the chief lessons of the lecture being that rest is good, torsion trustworthy, and Friar's balsam useful.

Lecture III. is an extremely good and useful selection of cases to illustrate the common-sense treatment of wounds of joints. The author sums up its lesson thus: "Wounds into large joints, severing tendons and bony processes, repeatedly, and, as I believe as a general rule, do perfectly well, if (in the absence of foreign bodies within them, or after their extraction) their edges be accurately approximated, air excluded, and the trunk and limb kept as nearly as possible in a state of absolute quiet" (p. 55).

In Lecture IV. are given some admirable cases of scalp wounds and fractures of skull, *without brain symptoms*, treated successfully by dry dressing, icebags to wounds, and iced milk as diet. Also a wonderful case of compound fracture of thigh, and lacerated wounds, the result of railway injury, which, from its description, would have been amputated by most surgeons, and yet healed well under gentle pressure, rest, and dry dressings.

The fifth lecture is on *materials:* oakum, tow, cotton wadding, etc., illustrated by cases, home and foreign.

Lectures VI., VII., and VIII. are on drainage, the germ theory, "Listerism," etc. Mr Gamgee has followed Mr Lister's own practice in 1873, but must have been unfortunate in his choice of time, for he had seen two ulcers—one of which we recognise by his description as a fine old chronic case, which has acted as text for many a long story on grafts and granulations—a carious metatarsus, loose cartilages, and *one* major operation. This was a ligature of the femoral, was dressed by Professor Lister himself, and showed on the second day redness, tension, and *some pus* (p. 123).

On the whole, we gather that Mr Gamgee is not a believer in either the germ theory or Listerism. Infidels still exist. He shelters himself behind the names of Ranke and Dittel, Birch-Hirschfeld and Ernst Fischer, who find septic coccobacteria and micrococci under gauze bandages, and has also studied the statistics of Spence and Callender, who have had results as yet unsurpassed. His brain, perhaps, has turned giddy with the perpetual-changes of practice he has heard of—from injections of 1–20 carbolic-acid lotion into compound fractures, down to a spray of 1–2000 of the innocent and fragrant thymol—or to the still more awful mystery of the permanent deep dressing, *aseptic, but not actually antiseptic,* which is to be fixed in position by some sticky material, as Canada balsam, or solution of guttapercha in chloroform. The work will form excellent reading for youths who, having been educated in antiseptic days, are apt to have very narrow views of the power of nature, and notions not a little pharisaical of the importance of their own aids to nature.

Gunshot Injuries: their History, Characteristic Features, Complications, and General Treatment, with Statistics concerning them as they are met with in Warfare. By Surgeon-General T. LONGMORE, C.B., F.R.C.S., Professor of Military Surgery in the Army Medical School. Illustrated by Fifty-eight Woodcuts. London: Longmans, Green, & Co.: 1877. Pp. 689.

WHEN a book is at once precise in its aim, thorough in its fulfilment of its aim, perfect in its method, arranged with nicety and published with care, reviewing becomes as easy as it is pleasant; and little really need be said beyond a recommendation to every one interested in the subject to procure and study the work. Professor Longmore's book fulfils the above indications admirably, and has the additional grace of agreeable style and a rare modesty. The book is well arranged under sections:—

I. Gunshot injuries and the means by which they are produced, including varieties of powder, bullets, rifles, and cannon. II. On the causes which influence the nature, characters, progress, and ultimate issues of gunshot injuries. III. On the characteristic features and distinguishing signs of gunshot injuries. IV. On the primary symptoms and complications common to gunshot injuries. V. Aids to the diagnosis of particular features and complications of gunshot injuries. VI. Secondary complications of gunshot injuries. VII. Ulterior consequences and disabling effects of gunshot injuries. VIII. General treatment of gunshot injuries in field practice. IX. Administrative arrangements for the care and treatment of wounded soldiers in time of war. X. Classification; and XI. Statistics of gunshot injuries.

The work is one which should be carefully studied not only by every army surgeon, but in these stirring times it ought to be in the hands of every medical officer, either of militia or volunteers.

The Cure of Rupture, Reducible and Irreducible, also of Varicocele and Hydrocele, by New Methods. By GEORGE HEATON, M.D. Arranged and Edited by J. HENRY DAVENPORT, A.M., M.D., Harv. Boston: Published by H. O. Houghton & Co.

THE author of this work is the American surgeon mentioned in the following terms by Sir William Fergusson at the end of the chapter on Hernia in his *Practice of Surgery*:—"Some years ago, I saw in London a gentleman of high standing and character in the United States, who had been radically cured of a reducible crural hernia. I afterwards saw the surgeon who professed to practise this method of treatment, and was promised the knowledge of it, provided I permitted reference to my name, and bound myself to secrecy. I declined such a compact, and I should scarcely have considered myself justified in such a work as this in taking notice of a professional matter of such importance, had I not been impressed with the idea that the surgeon in question was strictly honest, though imbued with an erroneous idea of ordinary professional character in this country."

We congratulate Dr Heaton on his acceptance, although tardily, of our English notions of professional dignity, and also on his determination to give to the profession at large his valued experience in the treatment of reducible and irreducible hernia.

His views on the unreliability of operations for radical cure, by closure of the hernial sac, are very decided. He does not consider "the peritoneum the great bulwark to the occurrence of hernia."

In his operations for radical cure, he directs his efforts to the closing of the hernial ring by setting up a mild form of inflammation (the milder the better), by what he terms *the method of tendinous irritation.* The instrument used for this method somewhat resembles the ordinary subcutaneous syringe, and is loaded with the modicum of irritating fluid. The operation is thus described:—"Armed with the instrument . . . . the operator introduces its beak into the inguinal canal, but outside the sac, if this has been suffered to remain, in the following manner: invaginate the right forefinger in the scrotum and find the external abdominal ring; then, with the left forefinger, press perpendicularly upon the integument directly over this ring, and use sufficient force to, if possible, press the integument together with the finger directly into the ring. The left forefinger being at or in the ring, the spermatic cord and the sac, if in the way, are to be pushed to one side so that nothing may remain between the external pillar of the ring and the finger, except the integument and subjacent superficial fasciæ. Keeping the left forefinger thus, take the instrument in the right hand and introduce its freshly-sharpened and polished beak *quickly,* penetrating the integument and superficial fasciæ, just passing but not grazing the external pillar, and entering the canal at once. Then remove the left forefinger and gently insinuate the beak further on, well into the canal, exercising the greatest care not to infringe upon the spermatic cord, which is sensitive to the slightest touch, or upon the fibrous walls of the canal. . . . . If the operator in attempting to pass through the ring should infringe upon or transfix one of the pillars (an accident to which the tyro is very liable), the instrument will not be able to be freely and easily moved about, which it is to a remarkable extent when the canal is successfully entered. . . . . Having satisfied himself that the beak of the instrument is in the canal, the surgeon then deposits about ten minims of the liquid irritant, emitting it drop by drop, and spreading it as much as possible."

The composition of the liquid element is as follows:—"Take of Thayer's fluid extract of quercus alba, prepared *in vacuo,* one half ounce; of the solid alcoholic extract of quercus alba, about fourteen grains. Triturate with the aid of gentle heat for a long time in a mortar until the solution is as perfect as possible."

In the treatment of irreducible hernia, where the reduction cannot be effected by repeated and carefully prolonged efforts at taxis, Dr Heaton strongly recommends cutting down upon and opening the sac, relieving the adhesions and returning the bowel, or where large masses of omentum are protruded, removing them. His success, as attested by a large number of cases, is most gratifying. We consider the views advocated sound, and the author's operation for radical cure worthy of extensive trial. There are chapters also on the treatment of hernia by the truss, on varicocele, and hydrocele.

Nature Series.—On the Science of Weighing and Measuring, and Standards of Measure and Weight. By H. W. CHISHOLM, Warden of the Standards. With numerous Illustrations. London: Macmillan and Co.: 1877.

THIS work, upon a very abstruse subject, must be interesting to a limited class of readers. To be understood and appreciated thoroughly, it requires a more careful and elaborate perusal than we have been able to bestow upon it; but we have read enough to convince us that the author has accomplished his task with great care and scientific precision. Many of the illustrations, we daresay all, are beautifully executed, and the whole getting-up of the book is worthy of the firm who publish it.

Some of the historical details are interesting. It may not be known to most of our readers, that in 1758 and the two following sessions, a committee of the House of Commons made many recommendations in relation to our standards, which, however, were not then carried into effect by law. Under their directions a new standard yard and standard troy pound, both of brass, were constructed as the intended legal standards of length and weight in this country. These were left in the custody of the Clerk of the House of Commons. In 1824 they were legalized as the "Imperial Standard Yard" and the "Imperial Standard Troy Pound." But they were unfortunately destroyed by the burning of the Houses of Parliament on 16th October 1834. The pains taken to replace these in a satisfactory manner is very remarkable. In future no such catastrophe can occur, as *four* parliamentary copies of the Platinum Pound are deposited at the Royal Mint, with the Royal Society, in the Royal Observatory at Greenwich, and immured in the New Palace at Westminster; and similar precautions have been taken with regard to the Standard Parliamentary Yard.

Kosmogonia: A Glance at the Old World, in which are set forth Certain Missing Links of the Darwinian Chain. By LAKE-ELBE. Edinburgh: E. and S. Livingstone: 1878.

WE might not have noticed this curious and rather original *jeu d'esprit*, had we not learned, on what seems good authority, that it is the reputed production of a young physician in our own city. It is an elegant thin quarto, of some seventy pages, with nearly double that number of short cantos, profusely illustrated with very clever but grotesque drawings of living creatures in various stages of development. Some of these exhibit amusing and easily-recognised caricature likenesses of living ecclesiastics more or less known to fame. The author evidently possesses a considerable amount of the native *vis poetica*, and in not a few passages of his poem depicts the imaginary cosmogony of the globe in its successive epochs with a vigorous hand. Without professing to have fathomed his aim and purpose in writing his little book, we can recommend it to our readers as an ornamental addition to the photographic albums and other attractions of the drawing-room table.

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXVII.—MEETING XI.

Wednesday, 8*th May* 1878.—Dr CHARLES BELL *in the Chair*.

Minutes read and approved.

I. *Dr Cappie* exhibited A CORD most elaborately knotted. There were two knots on the cord, both of which were of some complexity, and one of them was double. In his remarks on the case, Dr Cappie mentioned that the child was quite strong and healthy, but that the mother had noticed and been alarmed by the fact that she had felt much less stirrage than in her previous pregnancies. He thought that the knots were formed at an early period of utero-gestation.

II. *Professor Simpson* showed the PELVIS AND CONTENTS of a patient, aged 36, who had been sent to his ward under the impression that it was a case of inverted uterus. When admitted she was very yellow and anæmic and greatly reduced, pulse quick, temperature high. Local examination showed a rounded pyriform mass in the vagina, which did not allow exact diagnosis; the tumour looked pale and bled freely. Patient was too ill for further examination; the peritonitis rendered palpation impossible. She gradually got worse and died. On post-mortem examination the uterus was in its natural position and of somewhat large size; the pyriform body in the vagina was a polypus attached to the cervix by a narrow pedicle. The cause of death was purulent peritonitis.

III. *Dr Macdonald* showed an OVUM of a three months' pregnancy to show the uncertainty and difficulty that is sometimes met with in deciding on the age of a fœtus in the earlier months; the fœtus in this case was exceedingly small.

IV. *Dr Croom* showed a FIBROUS POLYPUS which he had recently removed. The patient had made a good recovery. The uterus had been dilated with sponge-tents, and the polypus twisted or torn off with a vulsella.

V. *Dr Macdonald* read a paper called ACCOUNT OF A CASE OF LABOUR COMPLICATED BY HYDROCEPHALUS OF THE FŒTUS, which appears at page 103 of this Journal.

Prof. Simpson thanked Dr Macdonald for his paper, which was really a treatise on cases complicated by hydrocephalus of the fœtus. As regards the diagnosis, however, Dr Macdonald had perhaps not made mention of the combined internal and external examination, which was of great value. In respect to the dangers which attend these cases, Dr Macdonald had given us a valuable disquisition on the mechanism with which the accident occurred. He did not go quite as far as Bandl in referring the site of laceration always to the cervix, because in a case he (Dr S.) had published years ago, there was a tear in the body of the uterus as well as in the cervix. It was hardly worth while. to consider Sir J. Simpson's remarks on this subject, because no one at that time had dreamed of the state of body and cervix uteri respectively, such as has now been shown by Bandl and others to occur. At the time, Sir James's views were by no means inconsistent with the new pathology. As regards treatment he thought puncture should be the regular treatment when the diagnosis was made. He looked upon the application of the forceps to such cases as involving much danger in consequence of the wide separation between the blades, which cannot be avoided. In head-last cases he had quite recently seen in Manchester a fœtus with an exceedingly large hydrocephalic head, where delivery had been effected after puncture through the palate, and the letting out of a very large quantity of fluid. This was, as far as he knew, a new method or plan of performing the operation.

Dr Croom had once, early in practice, met with a case, and had

failed to recognise its nature. The malformation was not to any extent, and was easily delivered by turning. The difficulty of diagnosis in the after-coming head was great.

Dr Cappie had met with three or four cases of hydrocephalus. One he delivered by the forceps and did not diagnose the case. The child was born alive and survived a few days.

Dr Burn could sympathize with Dr Macdonald in his meeting with difficulty in diagnosis, as the same had occurred to him on more than one occasion. When the diagnosis was made, the difficulty was mostly over, for puncture was a simple and easy proceeding. In one case the head had been left behind in the uterus: it was removed by blunt hook. The patient recovered. He had seen a like case occur in the hands of Sir James Simpson. In some cases the neck gives way very easily.

Dr Ritchie had only once had hydrocephalus to deal with, and in this case, pelvis being very roomy, the child was born without much difficulty. In another labour in the same woman the head of the child was natural, but the peritoneum was distended with fluid, showing the constitutional nature of the affection of the serous membranes.

Dr Allan Jamieson asked Dr Macdonald whether there was any after-pain after the injection of the ergotin, to which Dr Macdonald replied that he did not remember.

Dr C. Bell thought the paper an admirable and most valuable one. There were one or two points, however, not quite clear. As regards rupture, though the uterus may be the leading cause of the accident, the pelvis may assist, particularly in cases where there is a prominent and a sharp linea ileo-pectinea, as was long ago pointed out by Professor Hamilton. The difficulty in diagnosis was well known, particularly where the patient was very fat. In a case which came under my care recently, I delivered with forceps, and on delivery I found the circumference of the fœtal head was 17 inches. The woman was so fat that when the long forceps were applied to the fœtal head, the handles were completely concealed by the size of the nates and upper part of the thighs.

Dr Macdonald replied. He thanked the Society for the way in which his paper was received. He had omitted to mention the continued internal and external method, though he had carefully practised it. He thanked Professor Simpson for bringing this to his notice. He had referred to Sir James Simpson's remarks because he was the only writer of say thirty years ago who had made any attempt to trace the mechanism of these cases.

Part Fourth.

PERISCOPE.

MONTHLY RETROSPECT OF OBSTETRICS AND GYNÆCOLOGY.

By Angus Macdonald, M.D.

The Dilatation of the Cervix Uteri by Tangle Tents is the subject of an interesting article in No. 7 *Centralblatt für Gynakologie* of this year, by Dr B. S. Schultze of Jena. The underlying principle of his procedure is the assumption that for safe dilatation the tangle tent must never come in contact with a raw wound surface. But, besides this, Dr Schultze takes the strictest antiseptic precautions that the conditions of the operation allow of. To gain the end in view, namely, safe dilatation of the cervix, Schultze employs flexible copper sounds, of varying thickness, by which he ascertains the exact size and curvature of the cervical cavity. Having settled these points, a tangle tent, corresponding in thickness with the sound, which just passes the cervical cavity, is immersed for one or two minutes in boiling water, and being thus rendered flexible, the same curvature is given to it as that of the sound, which has been previously adapted to the cavity of the uterus. On cooling, the tent retains the curvature thus communicated to it, and after steeping it in a $\frac{2}{100}$ solution of carbolic acid, it is introduced through a speculum, the cervix being meanwhile held down by an assistant with a hook or vulsellum. If a drop of blood is seen coming from the cervix during any of these processes, the operation is to be postponed for at least twenty-four hours. The patient is to be kept strictly at rest during the whole time that the tent is dilating, and the strictest care is to be taken in the removal of the distended tent that no injury is caused to the cervix. The vagina and cervical canal ought to be then carefully washed out with a $\frac{2}{100}$ solution of carbolic acid. By these precautionary measures, the author states that he has been able, in several hundreds of cases, to dilate the cervix without any accident, and maintains that if his method is followed the usual contraindications to dilatation of the cervix can be very largely dispensed with. He holds that, according to his experience, chronic metritis, chronic perimetritis, and parametritis, even when the resulting catarrh is inconsiderable, are very beneficially influenced by repeated dilatation and subsequent washing out with carbolic acid. In a number of cases of enlargement of the uterus from chronic inflammation, Schultze was able to demonstrate by actual measurement diminution in size to have resulted from this treatment. These precautions seem to us worthy of consideration at the present time, when the attention of gynæcologists is so largely directed towards dilatation of the cervix as an aid in the treatment of uterine affections.

EROSIONS OF THE CERVIX.—The views entertained hitherto regarding these pathological conditions promise to be considerably revolutionized by the recent investigations of Drs C. Ruge and J. Veit, of Berlin, into the pathology of the cervix uteri. The results of these observers are the subject of a paper in the ii. band, 2 heft of the *Zeitschrift für Geburtshülfe und Gynäkologie*, page 415. According to them, the prevailing views that regard these so-called erosions as granulating surfaces bereft of epithelium are entirely incorrect. These reddened and irregular surfaces are in no case ulcerative, and their elevated portions are not composed of papillæ laid bare. Observers such as Tyler Smith, who examined the surfaces microscopically, were led astray by the methods used in preparation of the sections which destroyed the tender epithelium covering the surface of the so-called erosion. According to our authors the essential nature of the disease consists in an irritation of the rete Malpighii, or formative layer of the flattened epithelium covering the cervix. In consequence of this irritation the rete Malpighii is altered in character. The cells formed by it are not transmuted into flattened epithelium cells, but are longer and larger, and arrange themselves at first in a single row of cylindrical cells below the normal epithelium. In consequence of this the superficial epithelium gets undermined and drops off. The surface that is covered by the single row of epithelium is at first smooth, but by-and-by prolongations of it grow into the subjacent tissue of the cervix. These prolongations inwards are at first solid, being formed of a solid ingrowth of epithelial particles; but presently they widen out at their deeper parts and become tubes, and many of them becoming constricted at the point where they leave the general mucous surface, are thus converted into glands. The tissues in the spaces between these inward growths of epithelium increase in size, grow outwards, and become peculiarly vascular. It is these hypertrophied intermediate spaces that have hitherto been regarded as enlarged cervical papillæ. According to our authors every part of the reddened surface of these so-called erosions is covered over with a single row of cylindrical epithelium. The treatment must, according to Drs Ruge and Veit, consist in accurately determining how much of the cervical surface is affected by this irritative degeneration. Then that portion has to be removed by knife, or destroyed by some caustic. It is, according to our authors, immaterial what kind of caustic is employed, provided it is able to destroy the degenerate tissue.

CHLORIDE OF PILOCARPIN AS AN OXYTOCIC AND A CURE FOR ECLAMPSIA is suggested by Dr Franz Massman for trial as an oxytocic medicine, on the authority of two cases published by him in No. ix., 1878, *Centralblatt für Gynäkologie* and as a cure for puerperal convulsions by Prochownich in No. xii. of the same journal. Jaborandi infusion is also advocated by Fehling, in No. ix. same paper, as a successful means of treating puerperal convulsions. The *modus operandi* of its effects on eclampsia is attempted to be explained by reference to the Traube-Rosenstein theory of the convulsions. It is argued that the salivation and perspiration induced by the jaborandi or its alkaloid relieve the excessive vascular tension. (It seems to us, however, extremely doubtful that the same medicine could at once be an oxytocic and a cure of convulsions, when we consider the great tendency which uterine contraction has to induce eclampsia. The cases reported are far from convincing. Still jaborandi seems to deserve trial as a means of combating puerperal convulsions.)

THE ORIGIN AND MEANS OF PREVENTION OF PUERPERAL FEVER.—This is the burden of two lengthy and able papers in the *Zeitschrift für Geburtshülfe und Gynäkologie*, iii. band, 1. heft. The former of the contributions takes the shape of a memoir addressed by the Commission on Puerperal Fever, appointed by the Berlin Obstetrical Society, to Dr Falk, Minister of Instruction and Medical Affairs, etc. The latter paper is entitled "Investigations on the Frequency of Death in Childbed in Prussia: Its Causes and Consequences for the Health Department," etc. By Dr Max Boehr. In both papers the purely septicæmic character of puerperal fever is maintained, and the disease regarded simply as infected wound fever—the infection coming from within (seldom), from without from hands or instruments (frequently). The absolute necessity of the strictest attention to cleanliness and the use of disinfectants on the part of medical attendants and midwives is insisted on. It is also urged that it should be made compulsory to report every doubtful case that occurs in practice. Dr Matthews Duncan's statistical paper is reviewed in the most favourable terms by Dr Boehr, who is led by his own very extended statistical investigations to entirely agree with Dr Duncan regarding the non-epidemic nature of puerperal fever. It would appear, from a comparison of Dr Duncan's and Dr Boehr's tables, that puerperal fever has hitherto been very much more frequent in Berlin than in London. Dr Boehr is hopeful that the state regulations in regard to the duties of midwifery and obstetricians will yet further very greatly reduce the ravages of this disease throughout Germany.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By WILLIAM CRAIG, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

THE ACTION OF MORPHIA.—M. Calvet of Paris has published recently a physiological research of the action of morphia upon the various functions of the organism, and a clinical study of morphine as a therapeutical agent, especially in the relations of acute to chronic morphinism. In the first he observes, that both intravenous as well as subcutaneous injection of the hydrochlorate of morphine accelerates respiratory movements, succeeded by a period of retardation, and produces sometimes a momentary arrest or respiratory syncope. The same relative effects occur with the cardiac movements; at first accelerated, followed by retarded pulsations, sometimes even cardiac syncope. During this time animal heat exhibits analogous phenomena, namely, the elevated is followed by lowered temperature. In fact, the absorption of morphine, whether by intravenous or subcutaneous injection, produces a very marked influence upon the reflex actions. In certain cases the period of exaltation does not occur, but immediately after the administration of the drug the temperature becomes lowered, and the respiratory and cardiac movements are slower. Though he has not finally completed his researches, M. Calvet advances his opinion, "that the above phenomena are dependent upon the integrity of the connexion between the pneumogastric nerves and the encephalon, for if these two nerves are severed, the above-named effects do not occur, but only the ordinary sequelæ observed after this section." In the second portion of this thesis, M. Calvet offers the following interesting observations on chronic morphinism:—Nutrition is deranged, the animals becoming emaciated. For instance, an animal, which had received during a month a total amount of 3·52 grammes (twenty-five grains) of hydrochlorate of morphia, lost almost half its weight, became torpid, had dilated pupils, and walked with a jumping step, as if he had exalted sensation in the plantar surface. In this and other animals the secretions of saliva and urine were very much diminished. They died more often from marasmus or defective nutrition; but sometimes from convulsions as well marked as those which are observed in poisoning by strychnine. The anatomical post-mortem lesions observed in these cases were in the arterial encephalo-medullary region, and apoplexy in the vessels of the heart and stomach. Morphine was found in all the organs of the body, but not in the saliva or urine (*Boston Med. and Surg. Journal*, 20th Sept. 1877).—*The Practitioner*, June 1878.

THE USE OF DIGITALIS.—Recently a discussion took place at the Paris Société de Thérapeutique, on the therapeutic influence and mode of administration of digitalis in disease. Most of the speakers gave the preference to a cold infusion of the leaves over any other preparation, and were almost unanimous in condemning digitalin as being dangerous and unreliable, as it does not possess the diuretic properties contained in the leaves. Dr Hérand, who brought the subject to notice, recommends the following preparation:—Macerate for twelve hours twenty-five centigrammes of the powdered leaves of digitalis in two hundred grammes of cold water.

This is then strained, and the patient is directed to take it in five or six doses, in the twenty-four hours, at some distance from meals. This dose, he said, should never be exceeded if we wish to avoid its poisonous effects; and the quantity he prescribes is quite sufficient to produce the full therapeutic action of the drug, beyond which it is needless to push it. Dr Hérand considers digitalis one of the best diuretics known in affections of the heart; whereas, it is useless when there is no cardiac lesion, as, for instance, in cirrhosis, albuminuria, etc.—*Medical and Surgical Reporter*, June 1878.

NITRATE OF LEAD IN EPITHELIOMA AND IN ONYCHIA.—G. Calletti states that he has recently effected a cure in three cases of epithelioma, in one of which the part affected was the nose, in a second the cheek, and in a third the sternum. The mode in which he applied the remedy was by dusting the powder over the affected part, and recovery took place when this had been done about four times. Two obstinate ulcers of the foot, which had proved rebellious to other methods, quickly recovered under the same treatment. Vanzetti has recently recommended the use of the nitrate of lead in onychia maligna (*Raccoglitori Med.* 1877, No. 9).—*The Practitioner*, July 1878.

LARGE DOSES OF LIME-JUICE IN THE TREATMENT OF RHEUMATISM.—Dr. A. H. Chandler calls attention anew to the use of this old remedy, and reports several severe cases in which good results followed its use. Without regard to the condition of the bowels—unless previously much constipated—he begins with at least ten ounces of lime-juice, increasing rapidly to eighteen or twenty-four per diem, from half-an-ounce to one ounce or more every hour, with not less than double or treble the quantity of cold water, usually diluted and sweetened to the patient's taste. He finds that even on the second day the amendment is decided, and the disease, in acute cases, more particularly sthenic or asthenic, generally subsides on the fourth or fifth day of treatment. He usually prescribes one grain of opium, with or without lead and tannin, night and morning, in order to restrain the bowels, which the juice has a tendency to relax. The effects of this treatment are, he says, rapid diminution of joint-swelling, diminished perspiration, steady fall of pulse, which often becomes quite slow, with a slight tendency to syncope, the majority of cases requiring quinine and supporting food about the sixth day (*Canada Lancet*, Vol. X. No. 3).—*The Practitioner*, July 1877.

MILK AS A VEHICLE FOR QUININE.—"Milk is an elegant and convenient solvent for quinine, and it disguises to a great extent its bitterness. If one grain of sulphate of quinine be dissolved in an ounce of milk, we shall find that the bitterness of the draught is hardly perceptible; with two grains there is rather more bitterness, but it is not at all marked. A dose of five grains may be taken in two ounces of milk without any unpleasant bitter taste;

and if the same quantity be put into a tumbler full of milk, the bitterness is all but lost" (R. L. BATTERBURY, M.B.)—*British Medical Journal*, 29th June 1878.

INTRAVENOUS INJECTION OF MILK AS A SUBSTITUTE FOR TRANSFUSION OF BLOOD.—Dr T. Gaillard Thomas (*New York Hospital Gazette*) read a paper on this subject before the New York Academy of Medicine. The operation was first performed by Dr Hodder of Toronto, about 1850, who employed it three times in the treatment of collapse in Asiatic cholera. Next, Dr J. W. Howe of New York injected six ounces of goat's milk into the cephalic vein in a case of phthisis, but with no benefit to the patient. Dr Howe also injected cow's milk into the veins of five dogs, and they all died. The experiments of Dr Eugene Dupuy, made at the suggestion of Dr Thomas, proved that milk could be injected without any baneful results. In these experiments it was found, that cases of intravenous injections of milk which had been removed from the cow for an hour or two, invariably proved fatal, while the injection of perfectly fresh milk was followed by marked benefit. The method employed by Dr Thomas may be best illustrated by relating briefly one of his cases. A healthy cow was driven into the yard of the hospital, and eight and a half ounces of milk drawn from her udder into a porcelain dish, surrounded with warm water, were permitted to flow slowly into the median basilic vein of the patient from a glass funnel, to which was attached an indiarubber tube and a suitable nozzle, to be introduced into the opening in the bloodvessel. A rigor followed the operation; the temperature rose to 104° F., but these symptoms soon passed off, and the patient, who was moribund at the time of the operation, rallied and left the hospital in about three weeks. Dr Thomas has employed it in seven injections, and arrives at the following conclusions:—1. Injection of milk into the circulation in place of blood is a perfectly feasible, safe, and legitimate operation. 2. None but healthy milk drawn from the udder of the cow, within a few minutes of its introduction into the circulation, should be employed. It should be tested with litmus paper, and, if found to be acid, should be made alkaline by the addition of carbonate of soda. 3. A glass funnel, with an indiarubber tube and a suitable pipe attached, was much better and safer than a more elaborate apparatus. 4. Intravenous injection of milk was an infinitely easier operation to perform than transfusion of blood. 5. Intravenous injection of milk, like that of blood, was commonly followed by a chill and rapid rise in temperature; but these symptoms soon subsided, and were replaced by a great improvement in the general condition of the patient. 6. He would not limit lacteal injection to cases in which profuse and exhausting hæmorrhage had occurred, but recommended their use in certain cases of typhoid fever, pneumonia, cholera, etc.—*British Medical Journal*, 13th July 1878.

In Nos. 5 and 10 of the *Centralb. f. Chir.* (1878), Drs Lossen and Braun of Heidelberg relate their experience of neurectomy of the second branch of the fifth nerve, after osteoplastic resection of the upper jaw, in two patients who had long suffered from severe neuralgia in the nerve territory, corresponding to the distribution of that branch. The operation in both instances resulted in cure of the disease—the analgesia being permanently abolished, while the anæsthesia resulting from the neurectomy ultimately in great measure disappeared, the sensibility of the skin again becoming normal. Lossen, after discussing various views of this restitution of sensibility, doubts whether it was due to a reproduction of that portion of the nerve excised during the operation, and suggests either that neighbouring fibres assumed an increased growth, or that there was an exaggeration of the function of surrounding nerves, which may indeed have arisen from the trigeminus, though not contained in its principal branches, but isolated, or, as has been physiologically proved, anastomosing with the facial. He likewise quotes the researches of Arloing and Tripier, who found that when the nerves in the extremities in cats and dogs were divided, sensibility remained in the regions supplied by them, if even one collateral branch remained to conduct impressions to the nerve-centres.

Both cases were operated upon according to Lücke's method, and the result in both cases was, that for a lengthened period after union of the parts, the extent to which the jaws could be separated was very small. This the operators attributed to the detachment of the masseter from the lower jaw in Lücke's method, and independently concluded from experiments on the dead body that the operation could as satisfactorily be performed without detaching that muscle, and that the result was a more satisfactory action of the jaws. This, however, remains, as they say, to be determined by experience on the living subject.

Dr M. Ulrich Herzenstein (*Centralb. f. Chir.*, No. 11) recommends a *trellis-work dressing* for all kinds of fractures, which consists of pieces of wood pegged together in a fenestrated manner, like the ornamental trellis-work guards for flower pots. The peg-joints allow of movement, so that the fenestrated case can be increased or diminished in capacity at will. Several distinct circlets are used in dressing the limb, and these may form any angle with one another by being appropriately shaped with a knife or scissors. Dr H. claims the following advantages for this dressing:—

1. It is easily and quickly applied, and requires no special dexterity to do so.
2. It may be equally easily removed piecemeal or altogether.
3. The light and exact accommodation of the trellis-work splint to every shape of limb.

4. It unites all the advantages of known retentive apparatus, is the best fixed dressing, and operates like hardened bandages.

5. It can serve as the framework for plaster-of-Paris dressing, *e.g.*, in gunshot fracture of the lower extremity, although it is also itself very efficient in these cases, and may altogether supplant plaster-of-Paris.

6. It allows of the use of all kinds of dressing for wounds complicating fractures, such as the method of occlusion, Lister's method, the open treatment of wounds, warm applications, irrigation, and immersion.

With these and several other advantages (not stated) Dr H. hopes that fenestrated splints may be found of great service in war, and especially as the first dressing on the field.

THE CAUSE OF DISTORTIONS IN THE SPINAL PARALYSIS OF CHILDREN.—Dr A. Seeligmüller of Halle (*Centralb. f. Chir.*) draws some conclusions on this debated point, from an experience of over seventy cases, and supports that view which attributes the original distortion to the action of the unparalyzed antagonistic muscles, in opposition to that which ascribes it to merely mechanical influences, apart from such muscular action—the view ably maintained by C. Hüter and R. Volkmann.

S. employed the induced current to distinguish paralyzed from unparalyzed muscles, and remarks that such an examination only indicates the state of the muscle or muscles at the time being, but does not allow of any certain conclusions with regard to a former condition of these structures, and, moreover, insists that *only recently examined* cases afford incontestible proof for or against the antagonistic theory. He states that he has observed various forms of fixed talipes four weeks after the occurrence of paralysis, and affirms that the cases adduced in favour of the mechanical theory have not been sufficiently recent, as the patients had already used the limb in walking.

As showing the combined influences of muscular and mechanical force, S. narrates the case of a girl, two years of age, who, after an acute illness, exhibited paralysis and atrophy of those muscles of the right forearm supplied by the median and ulnar nerves, while the territory of the radial nerve remained normal. About eight months after paralysis, the consequent deformity was well-marked extension (dorsal flexion) of the wrist-joint and proximal phalanges of the four fingers, producing the appearance of a "griffin-claw." If, however, the forearm was held in a horizontal position for a time, the hand gradually sank into a position of anterior flexion at the wrist, while the extension of the phalanges persisted. In short, S. considers that the direction in which a deformity takes place is *primarily* imparted by muscular action, and that the mechanical influences of weight and the gravitation of the body only operate *secondarily*.

As an instance of HEROIC AURAL SURGERY, we may mention a case reported by J. Kessel in the *Arch. f. Ohrenheilk.*, Bd. xii. hft. 1, and referred to in No. 18 of the *Centralb. f. Chir.*, in which, to relieve labyrinthian pressure in a case of obstructed Eustachian tube, etc., the stapes was rendered mobile by cutting out a considerable portion of the membrana tympani, and then extracting the malleus and incus! The result is said to have been favourable in the first instance. The patient's hearing improved, and a troublesome tinnitus was relieved; but this improvement was transitory, in consequence of the great regenerative power of the membrana tympani, which could not be kept in check, either by repeated laceration or caustics, mineral or electric.

HUTER'S CARBOLIC ACID INJECTIONS.—Professor Petersen of Kiel (*Centralb. f. Chir.*, No. 12) gives testimony in favour of injections of carbolic acid in articular disease, as, undaunted by failures to benefit, and undeterred by success in making matters worse, he at last succeeded in curing (?) *three* cases, whence he concludes that otherwise hopeless cases may sometimes recover under this treatment, and that the intra-articular injection of carbolic acid is frequently free from danger, and quite harmless. The first of these cases was that of a boy, seven years of age, who had a two per cent. solution of carbolic acid injected into a chronically-inflamed and swollen elbow-joint, at first every other, and then every third day. Prof. P. states that the boy complained of severe pain after each injection. However, after four weeks, a peri-articular abscess formed and burst spontaneously. The injections were stopped forthwith, the opening enlarged, the cavity scraped out, and the part treated antiseptically—*gelistert*—(it must, doubtless, be gratifying to the late illustrious incumbent of the Edinburgh Clinical Chair to reflect that he has thus been immortalized by incorporation into the elastic Teuton tongue!) When the abscess healed in a few weeks, signs of inflammation could no longer be detected. It is stated, however, that the movements of the joint were rather hampered, and that passive exercise was therefore recommended. Prof. P. then lost sight of the patient, but concludes from this that the cure must have been permanent, as, otherwise, the patient would doubtless have returned again to submit to treatment. The second case, that of a girl aged seven years, was more satisfactory, so that the result is characterized as "brilliant." The patient had an inflamed wrist-joint, very painful on pressure. One gramme of a two per cent. solution was injected at first every other day, then every third day, and finally less frequently. After six days there was decided improvement, and gradually all pain vanished. Ultimately, the patient "could do anything with her hand;" but a little swelling remained, a little pain on pressure persisted, and the joint remained a little stiff.

In the third and last case, the result was "*eclatant!*" A girl, eleven years of age, suffered from synovitis of the left ankle, and had besides scrofulous ostitis of the right trochanter. One gramme of a two per cent. solution was injected into the joint, and, while under treatment, the child walked from school to the Professor's polyclinic. Except of pain after the injection, the patient is said to have complained of nothing else. Although, in this case, rest was not enjoined after the operation, Professor P. saw no evil result therefrom; on the contrary, the diseased condition improved, though slowly; but, as Professor P. justly remarks, "this was only to be expected."

ARE ECZEMA AND PSORIASIS LOCAL DISEASES OF THE SKIN, OR ARE THEY MANIFESTATIONS OF CONSTITUTIONAL DISORDERS? is the question asked by Dr Bulkley of New York, in a paper read before the International Medical Congress held at Philadelphia in 1876, and now reprinted separately. The question is an important one, since it has especially practical bearings on the treatment. Both diseases can often be successfully combated by local measures alone, and this idea is carried out to its full extent at Vienna, where external remedies are almost exclusively employed in dealing with them, and with most satisfactory results. Dr Bulkley discusses the question from all points of view, comparing, in the first place, the eruption in eczema and psoriasis with that occurring in diseases whose constitutional nature is undisputed, as syphilis and the contagious fevers, and showing both their points of agreement and difference, and here the evidence is strongly in favour of their constitutional nature. Too much has been made of so-called artificial eczemas, which are frequently non-symmetrical, and are, in fact, either simple dermatitis, or are real local eczemas developed from external irritation in eczematously-disposed persons. It is true that even undoubted cases of eczema may also be non-symmetrical, but other evidences of constitutional disturbance are to be found on a searching inquiry. As regards psoriasis, this element of doubt does not disturb us, as factitious psoriasis is so far unknown.

The clinical history of both diseases, again, is in favour of their constitutional origin; while most local diseases of the skin occur either exclusively, or at least most frequently, at some particular era of life, eczema is an affection of all ages, and psoriasis can only be said to be most commonly met with during the second and third decades, without being by any means confined to these. Both are subject to relapses, such being not unusually induced by a depression of vitality; and, again, hereditary influence is in each case well marked. The concurrence of bronchitis and asthma with eczema is but another link in the chain strengthening the connexion between this and constitutional disease. Hebra himself admits now a constitutional origin in eczema as the only mode of explaining why local irritants at one time develop it, while at another they seem, even in the same individual, to be powerless.

But, while evidence is against eczema and psoriasis being in their essence local diseases of the skin, there is no doubt that they *become* local in their skin lesions, and thus their *results* may be removed by local means alone. This explains the success which attends the external treatment pursued by the Vienna school, and it alone explains why local measures are so futile in commencing and rapidly-progressing eczema and psoriasis, although this rapid spread may be retarded or even checked by judicious internal medication. At Vienna an acute eczema is treated expectantly. Once the period of stasis is reached, when the disease is becoming or has become local, then these results, as the stiffness of a joint after a rheumatic attack, can often be removed by applications directed to them alone. Only a few of many most interesting questions raised in Dr Bulkley's paper have been touched on. The pamphlet is well worthy of careful and attentive perusal.

Part Fifth.

MEDICAL NEWS.

Bucellas Hock.—Sandeman Bros. of Lisbon have forwarded us a sample of a Portugal wine under the above title, which they inform us could be sold in this country at 24s. per dozen. It is a pure, somewhat sweet, full-bodied wine, and would make a good summer drink for invalids mixed with aërated waters.

PUBLICATIONS RECEIVED.

M. F. Anderson, L.R.C.P. Ed.,—Phosphates in Nutrition. London, 1878.

Dr A. Baer,—Der Alcoholismus. Berlin, 1878.

W. Braithwaite, M.D., and James Braithwaite, M.D. Lond.,—Retrospect of Medicine, Vol. LXXVII. London, 1878.

Edward H. Clarke, M.D.,—Visions: A Study of False Sight. Boston, 1878.

Alex. Harvey, M.D., and Alex. Dyce Davidson, M.D.,—Syllabus of Materia Medica. London, 1878.

Graily Hewitt, M.D. Lond., F.R.C.P.,—Mechanical System of Uterine Pathology. London, 1878.

Richard Metcalfe, F.S.S.,—The Water Cure. London, 1878.

C. E. Armand Semple, B.A., M.B.,—Aids to Chemistry. London, 1878.

Transactions of the American Medical Association, Vol. XXVIII. Phil., 1877.

A. De Watteville, M.A., B.Sc. Lond.,—Practical Introduction to Medical Electricity. London, 1878.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Address to the Medical Graduates in the University of Edinburgh,* 1st August 1878. By Professor ALEXANDER RUSSELL SIMPSON, Promoter for the year of the Medical Faculty.

GENTLEMEN, — As I have had the pleasure of requesting our Vice-Chancellor to confer on you the degrees which you have just received at his hands, it becomes my duty to address to you a farewell word, when the bond that has subsisted between us as Teachers and Pupils is being now dissolved, and is giving place to the wider and more enduring relationship of Fellow-Graduates, Fellow-Students, and Fellow-Practitioners. In these three relations I address you.

EDINBURGH GRADUATES.

I.—You are now our fellow-graduates—graduates of medicine in this University. The title, which by your industry and intelligence you have honourably won, you may well wear with honest pride. You need not be ashamed of it at any time, anywhere. It has not been wont to be bestowed on the incapable or the unworthy. Those who have earned it before you have won for it a world-wide reputation. Look around you, and you will see your fellow-graduates occupying most important spheres in all departments of medicine. Why, of the graduates engaged in lecturing in my own department in the different medical schools of England, one-third are M.D.'s of Edinburgh—exactly one-third, both in London and in the provincial schools, of the doctors of medicine who are teaching midwifery to-day, passed in their time under the magic cap which has played its interesting part in your graduation now. And what you see in England itself, you will find to be repeated wherever you may go, throughout all the wide (and widening) bounds of the British empire.

THE MEDICAL ACT AMENDMENT BILL.

How long Scotland is to play such an eminent part in supplying the medical necessities of England and its dependencies, no man may say. You know that a Medical Act Amendment Bill has for some time been before Parliament, which proposes to make very sweeping changes in the method of admitting entrants to the medical profession. I expected to have found it necessary to speak at some length of the scope of this Bill, and its probable effects on the profession generally, on the medical corporations, and on the schools of medicine. But the great interests of Turk and Tartar, and Jew and Greek, not to speak of British interests, have so engrossed the time and engaged the thoughts of our legislators, that the Medical Act Amendment Bill has, for the present, been to some degree lost sight of. We need not affect regret at the delay. This measure, that was to revolutionize so much in medical affairs, was itself only kept agoing, like a top, by passing through a series of revolutions which made one giddy to contemplate, and which showed that the framers of the Bill, while they saw the weak points in the old Act that called for amendment, had not fairly grasped the principles that ought to guide them to the requisite reform. For some reform there certainly is room; and the latest amendments do not forbid the hope that when men's minds have had time to settle down to sanity on every side, they will be able to devise a scheme whereby the examination tests of candidates for admission to the profession may be equalized throughout the kingdom, without causelessly disestablishing medical corporations which no man has condemned, and despoiling Scottish universities which all have eulogized. Meanwhile, be thankful that you have escaped a danger which this Bill, in one of its phases, set before our Scottish youth—of tempting them to enter the profession at a lower platform than that of the university degree under which such large proportions of them up till now have annually registered. It were much to be regretted that the close of such a career as is here open to the medical student should be crowned with anything less than a medical degree.

EDINBURGH TRAINING.

In Edinburgh you have had opportunities of studying medicine in all the round of its departments such as you could not have commanded elsewhere in Great Britain. The teaching power in London is unequally distributed over a dozen different schools. In Edinburgh, in consequence of the statute that permits a student to attend a fourth of his classes outside the University, all the teaching power is virtually concentrated into one great school. An idle or inefficient teacher in one of the London schools may trust to the reputation of his colleagues to keep up the numbers of his class; in Edinburgh, such an one, instead of finding his weakness compensated for by the strength of his colleagues, would find himself confronted with the healthy rivalry of several extramural teachers, whose class-rooms are in the neighbouring street, and whose classes students are free to attend. And when you pass from the lecture-room to the hospital ward, you meet with the choicest material for clinical instruction in the Royal Infirmary; for that magnificent charity attracts patients not only from the wynds and closes of our own city, but from all parts of the land, opening its gates wide, and without restriction, to all the suffering, while its officers are wont to welcome first the cases most in need of help. Having then enjoyed such a course of instruction, it is to you we look to extend and enhance the reputation of the degree with which that course is crowned. Above all, for this we look to those among you who have gained distinction in the course of your examinations. When, a few years ago, the General Medical Council sent down two visitors to inspect our examinations, I overheard a graduate explaining to one of those gentlemen the system according to which our honours are conferred, and stating how one under-average mark cancelled a candidate's claim for distinction. "But do you mean to say," said the visitor, "that if a man has good marks in every subject but one, that the one bad mark makes all the good ones go for nothing?" "That is so," was the reply. "That's very hard." "Perhaps it is, sir; but an Edinburgh graduate must have no stain upon his honours." The honours which you carry forth we trust to you to keep unstained. The title which has made you glad to-day we expect you so to wear that candidates in coming years shall in their turn be proud to win it too.

DO NOT CEASE TO BE STUDENTS.

II.—You must not fall into an error at the outset. You must not think that with your college career you can close your course of study; that leaving the class-room gives a right to leave your books behind you. No man will greatly blame you if, in delight at having reached the end of your curriculum, you toss a book up in the air and leap half-way to catch it. But do not take Macbeth's advice, and "throw physic to the dogs," lest you follow Macbeth's example, and go—after the physic. The books that you have plodded through wearily but patiently will glow with a living interest now when you read them again in the light of the needs of patients whose health depends upon your management. To authors, whose names have hitherto been the synonym for toilsome tasks, you will come back amid the exigencies of practice as to familiar, trusted friends, sometimes for counsel, sometimes for encouragement, sometimes for correction in your treatment. Let your diploma be less a proof that you have studied medicine for the past few years than a pledge that you will continue the study of it through all the years to come. Let it tell all men how, after due training in the liberal arts, you have been led through the wide field not only of practical medicine, but of all the cognate sciences. Let it be a proof to them that you have duly cultivated your powers of observation and reflection, so as to become scientific and accurate recorders without being mere fancy fact-collectors, and steady conscientious reasoners without being empty theorists. To yourselves let it be the starting-point for earnest, independent work.

THESIS FOR THE DOCTORATE.

Count yourselves happy, Bachelors of Medicine, that before you attain the *summos honores medicinæ* you have two years yet given you in which you may prepare a thesis on some subject within the range of your past medical examinations worthy of your training and your powers. Be glad that such a definite task is set before you. Choose soon, if you have not already chosen, your theme. Read about it, take notes regarding it, make observations and reflect upon it. Then, instead of having meagre essays sent to us with the pitiful plea, to which of course we cannot listen, that the writer is so busy with practice that he has not had time to do justice to his subject, we shall be flooded with theses of such value that the Faculty may be constrained to award, not our usual three, but three times three gold medals. Apart altogether from this matter of the thesis, try to keep up the habits of study which you have acquired, and which are themselves as valuable as the stores of information which you have accumulated. Especially let those in whom there dwells the healthy ambition to excel remember that Alexander, who began his outside career like most of you about the age of twenty-two, had the world at his feet ere he was thirty-three; and that if men have sometimes to wait till a riper age to reap the full harvest of their toil, yet all who then find a harvest worth the reaping have early sown the seed of it, and even gathered goodly first-fruits whilst they still were young.

IMPROVEMENT OF LEISURE.

The vacant hours of a man's commencing professional life must be well occupied. A young doctor should keep himself acquainted with the advances that are being made in some of the departments of practical medicine at least. If not, he will find that as years gain upon him his time gets taken up partly with patients, but more perhaps with other cares, till even if time were given him he finds the taste for study has got dulled, and all power of continuous application has been paralyzed. He looks up and sees some of his old fellow-students, who stood in the same rank with himself on the graduation day, in the very front of the advancing lines of science, some of them even doing pioneer work in its last-acquired domains; while, for himself, having forgotten much that he had once painfully mastered, he has to resign himself now at his best to play the *rôle* of

> "Perhaps a grave physician gathering fees,
> Punctually paid for lengthening out disease."

Aim at maintaining towards the various practical subjects such a relation as Virchow—no mean chemist, whilst, at the same

time, the acknowledged prince of pathologists—speaks of himself maintaining towards chemistry. I hope you have read his Munich address of a year ago on "The Freedom of Science in the Modern State." In that address he says:—"I have honestly laboured all my life to acquire a knowledge of chemistry. I have worked in the laboratory, but I feel by no means competent at once to take my place in a conference of chemists and to discuss modern chemistry in all its bearings. Nevertheless, I have qualified myself, with some little time, to bring up my knowledge at any moment to such a state that I should find no new discovery in chemistry to be incomprehensible. I am obliged to work up this knowledge anew for each occasion. I do not possess it already, and if I want to use it I must first obtain it. That which is my accomplishment is just *the knowledge of my ignorance.* The most important thing is, that I know exactly what I do *not* understand in chemistry." But I need not have gone to Germany for an exemplar for you, who will never forget that your capping day saw studious habits, original research, and high professional work, as well as high personal worth, honoured by your University in the graduation of Dr Risdon Bennett, Sir Joseph Fayrer, and Dr Lister. I go on rather to address you as

OUR FELLOW-PRACTITIONERS.

III.—The cultivators of science will look to some of you to take part with them in their efforts to wrest from nature undiscovered secrets; and I am sure they will not look in vain. But to the most of you the sick and suffering will look more urgently for help in their grim struggle with disease and death; and as practitioners of the healing art, you will be called wherever pale death and his forerunners come. In whatever sphere you settle down to practice you will find yourself surrounded by a circle of other practitioners, with whom it will be a prime duty to make friends. Call upon them, and make their acquaintance from the first. Regard them less as rivals for the public favour than as fellow-workers for the public good. Join some medical society or association in your neighbourhood for the cultivation of social fellowship and the promotion of medical knowledge, and take an active part in the conducting of its business. If none such exists, assist in setting one agoing. In a note received by post this morning I am asked to commend to you the Edinburgh University Club in London. It says:—"We constitute the only organized academical body outside the university, and are a strong bond to the *alma mater.* Your new hon. LL.D.'s are members, and can testify to the good work the club does." Be careful of the good name of your fellow-practitioners, and do not let it be an empty word when you call them your professional *brethren.* Never give medical advice to a patient who is under another doctor's care without the other's knowledge and consent. It will often be a relief to yourself and a comfort to your patients to have the advice and co-operation of a second physician. You can never suffer from consultation with an honourable colleague, and will often do well to be beforehand in suggesting it. What will probably distress you oftenest will be to see patients on whom you have bestowed much thought, and care, and skill, and not a little of your best affection, snared and taken in with the impostures and imbecilities of the motley crowd who hang on the outskirts of medicine, and who are always confident, because they do not know their ignorance. Their ways I need not stop to ask you to avoid.

WORK AND WAGES.

At the outset your practice will probably lie for some time largely, if large at all, among the poor. Do not grudge to give them the very best of your skill and care. Get into the habit from the first of thoroughly investigating every case, and bringing to bear on it all the best resources of your art. The cure of a penniless pauper may bring you as much credit as the cure of a purse-proud patron. The latter may be apt to think his patronage reward enough with the addition of a paltry fee—the former feels in debt to sound your praises everywhere. In any case, it is itself a good reward to see life prolonged or pain relieved, and often that will be your only recompense. But, meantime, do not doubt that by-and-by more patients and more pay will come—all the sooner the more earnest you are in doing the work and the less eager for the wages. Not that these should be despised. Far from it. No labourer is more worthy of his hire. People who could pay quite well too often expect to get from a doctor a prescription, which they would not expect a druggist to compound, for nothing; and you must never hesitate to demand a fair remuneration, though you will no doubt meet the difficulty which your predecessors have experienced, and which one of the most famous London surgeons once expressed to me by saying, "I always find it the most difficult part of every operation to name the fee." Only beware of cultivating the spirit which betrayed itself in the remark made by a busy physician to an old student friend who called at his consulting hour—"I'm just busy at the receipt of custom;" and more grossly in the first question which another London consultant addressed to a doctor who had called him to see a patient some distance in the country —"How much may I expect for coming here?"

EXERCISE OF COMMON SENSE.

For fair success in practice, after the accomplishments you have acquired within our walls, what you mainly need is to exercise the priceless endowment of common sense. I suppose there is no place for it in any curriculum, because it cannot be trained in the men who lack it, and it keeps training itself in every happy possessor. We do not pretend to have imparted it, and you must find out for yourselves how to develop it in your intercourse with patients, and, where it is sometimes called on for its most delicate and difficult tasks, with their friends. It will be a great help to you if you can begin your work under the guidance of a good practitioner.

PHYSICIAN AND PATIENT FELLOW-MEN.

But let me impress upon you one point ere you go. You have been making your acquaintance with disease so much from books and from special cases marked out and lectured on in the clinical wards that your conceptions of it are mainly abstract, or only associated with individuals for whose progress you felt no responsibility. But when you go out to practise you will find that you have to do, not with disease only or mainly, but with diseased men and women; and whilst you are not to lose sight of the scientific aspects of any case, you are not to forget that the patient is more than a pathological specimen. Try to put yourself in his place, and think how you would like a man of science to come into your sick-room with the cold "How do you feel to-day?" which implies that he only wants to know whether the temperature is up or down; who lays his hand upon the pulse only to judge at what rate and in what volume the heart is pumping out its blood, and proceeds to interrogate and examine till he has satisfied himself whether an effusion, say, has lessened or increased; who makes you feel all through the interview that your disease may be a very interesting phenomènon, but that you yourself are nothing in particular, and at the end only takes your hand to say good-bye for the sake of the guinea you will leave in his. You need not quite take every patient to your bosom, but you may at least let each one feel that a kindly human heart is beating there. In cases where there is a lengthened illness you may be apt to rush from one patient to another, and give but a few minutes' time and thought to each, forgetting that what is to you almost a routine task is to the poor sufferer the one event of the dreary day. Cultivate, then, considerate ways with all your patients, and carry into every sick-room all the cheerfulness and sunshine within the compass of your being. If morbid processes merely were to be studied, you could do that in the lower animals, but in every patient see a fellow-man.

FELLOW-MORTALS.

Recognise also that your patients are your fellow-mortals. Do this both for your own sake and for the sake of your patient's relatives. For your own sake: and some day when you are stunned and stricken with dismay to see a patient die, it will be some comfort to remember that your professional brethren before you have passed through the same experience, till there were moments when they wished they had been anything but doctors. For the sake of mourners: and when you see the inevitable end draw near, never hide from others what you would not wish concealed from yourself. I never yet saw harm come to a patient from being told the truth, and I do not believe you ever will. But keep up delusive hopes till all is over, and you will make orphans feel as if they had been cheated of a blessing; you will add to the peculiar soreness that fills the hearts of parents when their children die; and you will send the widow to her lonely lot embittered with a long regret.

FELLOW-IMMORTALS.

Remember that your patients are also your fellow-immortals. You have been tasting the felicity of tracing effects back to their causes. This is the very work in which, as students, you were being trained; and some of the authors you have been studying may have had the well-known Latin line as a motto on their titlepage. But if any one in this Christian era will allege in the name of science that death ends all for us, then the pagan poet will rise in the Judgment and condemn him, for Virgil did not sing—

> "Felix qui potuit rerum cognoscere causas,"

without adding

> "Atque metus omnes et inexorabile fatum
> Subjecit pedibus, strepitumque Acherontis avari."

ADIEU.

But it is time, Gentlemen, that we should say Farewell. You have chosen for yourselves a noble profession in which to do your life-work. We have done our best to aid you in your preparation for it. And now, as you pass from under our hands, we follow you with our heartfelt wishes for a fair start in practice, for a prosperous career, and in the end for a happy close—the happiest and the highest.

ARTICLE II.—*Notes of Three Cases of Accidental Hemorrhage, with Remarks.* By Dr C. E. UNDERHILL.

(*Read before the Edinburgh Obstetrical Society, 12th June* 1878.)

I HAVE put together the notes of the three cases which form the substance of this paper, because the subject is one which has not been brought under the notice of the Society for some time past. We have had many debates on post-partum hæmorrhage and on placenta prævia; none of late years on accidental hæmorrhage, so-called.

The cases have this at least of interest, that, though the anatomical condition which caused the hæmorrhage was the same in all of them, namely, premature separation of part of the placenta, the exciting cause of this separation was different in each.

CASE I.—*Saccated Uterus.* Mrs C., aged 25, pregnant nearly eight months with her third child, sent for me at 10 A.M. on 1st August 1873. She said she had had a severe flooding during the night. She has had similar floodings four times during the present pregnancy, the first of which occurred at the tenth week.

The patient was pale and anæmic, and the bleeding had almost or altogether ceased. Pains occurred at long intervals. On examining the abdomen, the uterus was felt to be about the size of a seventh-month pregnancy; it felt contracted and hard. In the right iliac region was an offshoot or projection from the body of the uterus, which gave the sensation of being about the size of a fœtal head, but which increased and diminished in size at times. This offshoot or tumour was continuous with the uterine tumour, but their most prominent parts were separated by a shallow sulcus. The tumour was rather soft, and at first its physical characters, coupled with the fact of recurrent hæmorrhages during pregnancy, made me suspect it was a fibrous tumour, softened and enlarged along with the pregnant uterus. The patient complained of feeling pain in the tumour occasionally. Vaginal examination showed the os to be slightly dilated, and the membranes entire. No hæmorrhage. The hæmorrhage returned in the afternoon, and at 7 P.M. I found the os well dilated, the membranes entire, and some bleeding. I ruptured the membranes, and, the pains being regular and quick, a small child was soon born; it was at about the eighth month. It required great care and warmth, but was alive a month later.

On placing my hand upon the uterus after the child was born, I distinctly felt the tumour above-mentioned contracting and expelling the placenta, and was quite satisfied that it had been the seat of the placenta. Any doubt I might have had on this matter was set at rest by the appearance of the placenta itself. It was arched out into a cup shape, the fœtal surface forming the concave part of the cup. The rim was so firm that, on placing it upon the table, the placenta retained its cupped shape—the cord was attached to the bottom of the cup. The cupping was very considerable, and the whole placenta may be not inaptly compared to a skull-cap turned inside out. The patient made an excellent recovery.

I regret very much that the notes I preserved of this case are so very imperfect. My impression is that very shortly after labour the tumour became almost entirely identified with the ordinary outline of the uterus, but I have no note as to that point. Mrs C. subsequently had another child at the full time, and nothing unusual was noticed by her medical attendant, to whom I had communicated the unusual circumstances of the present labour. She had no return of the hæmorrhage during the course of the subsequent pregnancy or at the time of labour.

Remarks.—The amount of flooding in this case was not sufficient to cause any alarm, except as occurring in a pale and delicate woman. It required no treatment further than the rupture of the membranes. The condition of the uterus, however, which caused the flooding seems to be of great rarity. A case very similar to mine is described by Dr Matthews Duncan in his *Researches in Obstetrics*, page 441, 1st edition, where the condition was associated with vagina duplex. In his case, the sac containing the placenta appears to have been rather farther removed from the uterus than in mine. He has called the condition "saccated uterus," and gives references to other authors who treat of this exceedingly rare malformation. Dr Duncan considers it an open question whether the saccated condition indicates a tendency to duplicity of the uterus, or whether it is one of "those curious cases of gestation, in which the placenta has been developed in a Fallopian tube, while the fœtus grew in its normal site, or in which some other like anomaly has been represented as occurring." A condition more like the latter of these two hypotheses seems to have been the state of matters in the present case, because the tumour, to the best of my belief, disappeared after the labour was over, and because it was not present in a subsequent pregnancy, when it was specially looked for by the gentleman in charge of the case. There is no mention made of hæmorrhage in Dr Duncan's case.

That the sac was formed of contractile tissue is quite certain. The patient herself was aware that it changed in size and consistence at times during pregnancy, and I felt the contractions during labour and at the expulsion of the placenta. The hæmorrhage was doubtless due to some irregular contractions of this abnormal sac causing rupture of utero-placental vessels, and probably some separation of the placenta. I have not noted whether any traces could be found in the placenta of old hæmorrhagic infarcti.

CASE II.—*Traumatic.* I was called to this case by Dr J. R. Morison, then resident surgeon at the Cowgate Dispensary, who thought he had to deal with a case of placenta prævia. He gave me the following history :—

Mrs M., aged 32, in the ninth month of her eighth pregnancy, was engaged about mid-day (17th July 1874) hanging clothes to dry out of her window in the Cowgate. To do this she leaned upon the window sill, so that most of her weight came upon the pregnant uterus. She is a large and powerful woman, and correspondingly heavy. While doing this she began to flood violently, and before long fainted. This checked the severity of the flow, but it did not stop entirely. I did not see her until 5 o'clock P.M., when I found her considerably blanched, with a quick and weak pulse, and with bleeding still going on slowly. The os uteri was very high up and dilated to the size of a florin, the head presented, the membranes were entire. The fœtal heart could not be heard; the uterus was bulky and harder than usual. Chloroform was given, and I passed my hand into the vagina, and with three fingers in the uterus endeavoured to turn by the bipolar method. This proved to be exceedingly difficult; but at last I did succeed in getting down a foot. A loop of the cord came down with the foot; it was pulseless and flaccid. A dead male child, well-grown and healthy-looking, was born at 7 P.M. The placenta was followed by a very large quantity of clots, which had no doubt separated a large portion of it from the uterine wall. The patient made a slow but perfect recovery.

Remarks.—In this case the cause of the accident was clearly traumatic. The pressure upon the uterus, caused by almost the whole weight of a heavy body being thrown upon it, had separated a portion of the placenta; the existing hæmorrhage, which soon made its way externally, increased the separation, and the clots which formed caused the separation to extend still further. Had the placenta been very firmly attached all round its margin, we might in all probability have had a case of concealed hæmorrhage, with very possibly a fatal issue; for, had the blood been prevented from escaping, the clots which were forming would have still further detached the placenta and might easily have made the separation complete. As it was, the separation was sufficiently extensive to cause the death of the child, and to reduce the mother to a serious but not excessive state of anæmia. On my first examination I was very nearly led to agree with Dr Morison's diagnosis, and to believe the case was one of placenta prævia. The thickness and roughness of the membranes, with small clots adhering to them, gave a very deceptive feel, and it was not until I had made a very careful examination that I made out the true state of matters.

The difficulty of performing bipolar version was much greater in this case than in any other in which I have adopted this method of turning, and was due, no doubt, to the large clots lying behind the placenta preventing the fœtus from being readily pushed round. In two cases in which I have used this method within the last few weeks—once for placenta prævia, and once for contracted pelvis—nothing could be more satisfactory than the ease and rapidity with which the position of the child was altered and the version completed.

I shall defer the consideration of the treatment adopted for some remarks at the end of the paper. In notes taken at the time, I have remarked that the uterus lay quite on the left side of the body, contrary to the usual right-sided obliquity.

CASE III. — *Diseased Placenta.* Mrs T., a delicate and very anæmic woman, aged 24, was taken in labour with her first child on 23d November 1874. She was at the full time. She was seen by the late Dr Myrtle at 5 o'clock. He found some hæmorrhage going on, but as it was but slight he left. At 9.30, as Dr M. was unable to go back himself, I was sent for, and found there had been considerable bleeding going on, and that the woman was much reduced in strength. The head was low in the pelvis, the membranes entire, and the os dilating. I ruptured the membranes and gave a dose of ergot. A small but mature and living male child was born soon afterwards. The cord, which was twisted twice round the neck, could not be felt to pulsate when the head was born. The child, which was a meagre, miserable infant, showed symptoms in a fortnight of congenital syphilis, and died of that disease on 3d January 1875.

The placenta came away without difficulty. It was in a highly diseased and abnormal condition. Of irregular fiddle shape, it measured 8 inches in the longest diameter by 7 in the greatest transverse diameter, and 3 at the narrowest part. It was made up of two principal large and prominent cotyledons, opposite the larger of which the cord was inserted. It varied greatly in thickness in different parts, big patches here and there being thin, yellow, fatty, and hard. The smaller cotyledon was the thicker of the two, and at one point near the edge there had been a tear in the placental tissue, which was at this spot soft and œdematous, and a separation of the placenta from the uterine wall. The tear had taken place close under the membranes, and some small clots were found in this position. The hæmorrhage appears to have come from the separated and torn portion and the adjacent uterine wall, and to have had its exciting cause in the disease of the placental tissue. I had intended to have made a careful microscopical examination of this tissue, but the placenta was unfortunately destroyed.

I ascertained that this woman had suffered much from palpitation and anæmia for a year or two before the birth of the child; but there was no heart disease. I could obtain no history of a syphilitic attack, either primary or secondary, nor were any traces of the disease to be found upon her. She has since borne a well-grown healthy child, which has, up to the age of five months, shown no symptom of disease. She has aborted once between these two pregnancies, but I was then away from home and did not see the aborted ovum.

Remarks.—Accidental hæmorrhage is not very common, and in the majority of cases not very severe. In only one, No. 2, of the instances just related was it so severe as to give rise to much anxiety. Their main interest lies in the fact that they illustrate three of the causes of ante-partum separation of placenta: No. 1, irregular formation of uterine body; No. 2, external violence; and No. 3, disease of placenta, in all probability syphilitic. So extensive was the disease that I was surprised to find that it was able to support a living child. Possibly in the third case the very anæmic state in which the patient had been for several years may have given an additional tendency to the occurrence of hæmorrhage. Case 1 also occurred in a very delicate, anæmic person. Many other causes of accidental hæmorrhage are given by authors, the most prominent, after traumatic causes, being sudden and excessive emotion, diseased general states, and local uterine disease. Other cases occur in which it is difficult or impossible to find any cause. Anæmia is undoubtedly a predisposing cause.

I have not made any mention in relating the cases as to whether the hæmorrhage occurred with or between the pains, because, firstly, I have preserved no note of this point; and, secondly, because it seems to me to be of no great importance, diagnostic or otherwise, and frequently to have had too much value attached to it.

As regards the treatment of accidental hæmorrhage, there is now a pretty general consensus of opinion that rupture of the membranes is in most cases sufficient to check the flow, assisted, if necessary, with a dose of ergot of rye. Should the hæmorrhage still continue with severity, the uterus is to be emptied as quickly as possible, either by turning or by rapid dilatation and the application of the forceps, and the necessary uterine contraction secured. The elder Rigby, in his classical work, was the first to bring prominently before the profession in this country the distinction between hæmorrhage occurring when the placenta is in a normal situation and that dependent on placenta prævia. He insists strongly on the point, that in the former case rupture of the membranes is the only necessary treatment, and that after that is done the case may, for the most part, safely be left to nature; and he adds that, in the numerous cases which fell under his notice, he never had occasion to turn or adopt any further treatment. He supports this view by the evidence of Merriman, who states that, in upwards of thirty cases of accidental hæmorrhage which he had observed, after rupture of the membranes the hæmorrhage had either ceased or been so far diminished as to secure the safety of the patient; and yet, he adds, there were some among these cases where the hæmorrhage was sufficiently alarming. Even Rigby, however, admits that cases may occur where, for instance, the separation of the placenta has been produced by great violence done to the abdomen, and where the hæmorrhage is so profuse that nothing but a speedy delivery by art will put a stop to it. Such a case, I conceive, was my second one, where the separation had been extensive, and where the large clots which lay between the placenta and the uterine wall would probably have proved an obstacle sufficient to prevent uterine contraction from being strong enough to stop the flow. I think, therefore, that in that case the treatment adopted was fully justified, though, were the same circumstances to come before me now, I should probably be inclined to try the effect of rupturing the membranes before proceeding to adopt any other measure.

Some, however, recommend the use of the tampon — Duges among the earlier authors, and Spiegelberg among the later—advising this practice. The older authors who held this view based it on the notion that the pregnant uterus was quite filled by its natural contents, and could not be further distended. This was the opinion of Dewees, Capuron, Dugès, and others. How far from the truth it is has been frequently shown by the numerous cases now on record of death from concealed hæmorrhage, and by the flaccid appearance presented on dissection by the undelivered gravid uterus in the later months of pregnancy. On this point William Hunter says (see *Ingleby, A Practical Treatise on Uterine Hæmorrhage*, p. 132):—"We are apt to consider the uterus when containing the fœtus and membranes as being tight and distended, so as to preserve its shape when taken out of the body; sometimes it may be so, but in the state in which it generally is at the ninth month, it will hold a pint, a quart, or now and then two quarts, or even more. It is rather in a loose state, not quite tight, and only about three parts full." I was much struck with the flaccidity of the uterus of a woman who had died suddenly during labour, when the os was more than half dilated, upon whom I made a post-mortem some years ago. In recommending the vaginal plug for the severer cases, Spiegelberg directs us at the same time, by the hand externally, to keep careful watch over the body of the uterus, so as to control or avoid the occurrence of internal hæmorrhage. The grounds on which he advises the plug are, that its use generally sets the pains agoing, and they are the surest means of stopping the hæmorrhage; for the same reason one ought, he says, if the cervix is sufficiently prepared, to rupture the membranes; and he advises us to let the waters escape slowly, and to watch and compress the uterus externally.[1]

I cannot help thinking that the use of the plug in these cases is not without danger, particularly in the hands of the inexperienced, who might easily be led into a false feeling of security, and neglect the very careful watch over the uterus which its use entails.

The same objection does not apply, to anything like the same extent, to the use of the indiarubber bags for plugging and dilating the cervix, particularly after rupture of the membranes, and I should be inclined to rely upon—1st, Rupture of the membranes, with administration of ergot or ergotin, provided there were no condition present, such as contracted pelvis, to contraindicate its use; 2d, Should the hæmorrhage continue, turning, if it were still available, or, better still, rapid dilatation of the os with Barnes's bags, and subsequent speedy delivery, if necessary, with the forceps.

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[1] *Lehrbuch der Geburtshülfe*, Lahr, 1877, Erste Hâlfte, s. 390.

ARTICLE III.—*On Hydrophobia: Its History and Cure.* By Dr ANDREW WILSON.

ON the 4th of December last a scene, which, for brutality and cruelty committed under mistaken motives, could hardly have been equalled, was enacted in one of the streets of Edinburgh. In the newspapers of the following day appeared a paragraph stating that a mad dog had been destroyed in the streets of Modern Athens, and the public of Edinburgh were accordingly put on the alert regarding the supposed advent of an epidemic of the dreaded disease. It was perfectly true that a dog had been destroyed, but it was not true that the dog was suffering from rabies, or canine madness. The words of a newspaper correspondent who witnessed the butchery of an innocent animal are clear and distinct. The dog—a black retriever—comes upon the scene, pursued by a policeman. That official is accompanied by the usual retinue of message-boys and *canaille*, to whom any dog, pariah or otherwise, is an object of extreme interest, as admitting of a display of the savage traits and hunting instincts which the said urchins have possibly inherited from their far-back ancestors, and which the progress of civilization has not yet succeeded in eliminating. One of the said message-boys discharged his basket, in lieu of a nobler missile, at the retreating animal, which then, in hopes of safety and protection no doubt, quietly followed two men who were walking down the street in question. Hearing the uproar, however, one of the men turned, seized the dog by the ear, and, as was perfectly natural, and, in my humble opinion, a perfectly just and legitimate reward for his interference, got bitten for his pains. The valiant flying squadron of message-boys, headed by the representative of law and order, had meanwhile arrived upon the scene. It was no stalwart man the policeman had to attack, nor even, according to his theory no doubt, a reasonable or sensitive being. So, with a stolidity which renders one somewhat compassionate for the human beings who fall under this particular policeman's grasp, he drew his staff, and, to use the term employed by the newspaper correspondent, "rained" down blow after blow upon the head of the defenceless animal. For five or ten minutes this sickening scene continued, we are told, in a city of culture and education. Then the dog's head was placed in a noose, and willing hands pulled one end of the rope one way, whilst equally willing hands pulled the other way, exemplifying a kind of Thuggish experiment in strangling the animal. With its head well-nigh pounded to a shapeless mass, and with blood welling from its eyes, nose, and mouth, and surrounded by a crowd of Christians intent on asphyxiating it, the unfortunate animal nevertheless had the impertinence to continue to exist. Elevated in the air by the efforts of the contending parties in the work of strangulation, the policeman was seen to kick the dog in the most brutal manner, and the final act in this tragedy was wrought by a smith, who, more humane than his neighbours, struck the suffering animal with his hammer, and put an end to its sufferings. The secretary of that most admirable institution, the "Home for Lost Dogs," in a letter to the *Standard*, gives a case serving as an admirable parallel to the Edinburgh massacre. As a police-constable was bringing a homeless pug-dog to the institution at Battersea, the animal took a fit close to the "Home." Immediately there arose the usual cry of "mad dog," and an excited crowd advocated the destruction of the animal. Fortunately one of the officials of the "Home" appeared on the scene, and at once saw that the dog was merely suffering from a simple fit. The patient was taken home, appropriately treated, and soon recovered. The large experience of the officials of the "Home" testifies to the extreme rarity of cases of rabies in the streets. And the slaughter of many an unfortunate dog has, *quoad* rabies, been therefore as unjustifiable as would be the sudden execution of a human being in an epileptic fit, because the *vox populi* elected to pronounce the patient hydrophobic.

Such is the history of a street scene which is simply typical of these days. The justification of the whole procedure, I apprehend, will be that of saying that the dog was mad, and was therefore a fit subject for execution. I admit that, if mad, the dog should have been killed, but I also contend that it should have been killed in a respectable and less savage and cruel fashion. Edinburgh, as any one who reads the newspapers may see, is a city eminently distinguished for philanthropy, and, amongst other works of charity, delights to support a Society for the Prevention of Cruelty to Animals—of which Society, by the way, I believe every police-constable is *ex officio* an officer. Admit that the dog was mad, and of course society and the law will ratify its death,—common humanity and the same law, however, demanding that it shall not be tortured. But mark the instructive sequel to the story. The *Scotsman* of Wednesday, 12th December, informed the inhabitants of Edinburgh, and of Scotland generally, that Principal Walley, of the Edinburgh Veterinary College, had prepared a report of his post-mortem examination of the large retriever dog which had been killed in the streets in the previous week. The report set forth that "the lesions presented were not such as to lead one even to assume that the dog had suffered from rabies." This is strong and plain language, and one can only hope that the member of the Edinburgh police force who assaulted the innocent animal, and the wayfarers who pulled the rope, have read Mr Walley's remarks, and have duly reflected on the morality of their procedure. So, after all, the slaughter of the dog was unnecessary, and was, moreover, considering the harmless character of the animal, a piece of diabolical cruelty. We have heard nothing of the ownership of the dog, but we should be pleased to hear that he or she had raised an action against either the policeman or the city to recover the value of the animal. And we may recommend the conduct of the policeman and his coadjutors to the notice of the law, as affording a most appropriate chance for the institution of a prosecution for cruelty of a most exceptionable kind to an animal. A writer in the *Scotsman* of Thursday, 13th December, remarks that the boys of this city look upon dogs as lawful objects of assault with stones and with pins ingeniously driven into pieces of wood, which are hurled, *à la* the boomerang, at dogs as they pass. Hence the ease with which the cry of "mad dog" is raised. A dog more plucky than his kind will turn upon his assailant, who decamps, and, crying "mad dog," speedily secures his own safety, a large modicum of sympathy, and the death (by torture) of his victim.

I have dwelt upon what has been termed a common street scene, in order that my readers may form for themselves an opinion regarding the tortures to which innocent animals are subjected by unskilled professors, and also for the purpose of influencing the public at the outset of our inquiries in the cause of intelligence and humanity, as against brute ignorance and unnecessary cruelty. The advantage of the "Dog's Home" in London was admirably illustrated by the procedure of the Glasgow authorities some time ago, when the cry of "mad dog" was raised in the commercial capital of Scotland. Every dog not provided with a muzzle and the name of the owner, was seized by the police, detained for a short time by the authorities, and if not claimed at the expiry of the allotted period was destroyed. Hundreds of valuable dogs were thus either sacrificed or were placed in extreme danger of their lives, and without, in the vast majority of cases, the slightest pretext for the slaughter. Such a procedure exemplified with a vengeance the apothegm that "prevention is better than cure." Only the proverb might have been just as forcibly illustrated by the establishment of a temporary "Home" for the reception of the perfectly healthy stray dogs, whose owners would be only too glad, I imagine, to contribute to the support of the institution in consideration of the safe return of their pets. In what follows I may be able to show that the subject of hydrophobia is one concerning which much misconception exists, and regarding which much needless alarm is yearly caused. Whilst I may also endeavour very shortly to indicate the leading features of the malady, its nature, and the modes of prevention and cure which modern authorities agree in recommending and in using.

To begin with, there is no hesitation in ranking hydrophobia as a specific disease induced and propagated in man by inoculation with the saliva of a dog afflicted with rabies or canine madness. In other words, the changes produced in the saliva of a dog afflicted with rabies render that fluid capable, when introduced into the blood-circulation of a human being, of inducing the symptoms of hydrophobia. That the virus or poison contained in the saliva of the dog is in reality the exciting cause of hydrophobia appears to be an unquestionable fact. Persons who are bitten by dogs in a state of health never suffer from hydrophobia, and it need hardly be remarked that the disease has never been known to arise independently of the bite of a diseased animal, usually a dog,—but, according to some authorities, occasionally the cat; whilst, as alleged in the historical case of the grandfather of the present Duke of Richmond, the saliva of the fox may serve as a medium for the generation of the virus. This latter case, however, appears to present some elements of doubt. According to the usual account, death was caused by the bite of a tame fox which the Duke was endeavouring to separate from a dog with which it was fighting. Another account alleges that the bite was inflicted by the dog; but the case, although apparently of undetermined nature as to the exact origin of the poisonous matter, need not be regarded as presenting any very exceptional elements; since the occurrence of hydrophobia in other carnivorous animals besides dogs would form no unusual feature, but, on the contrary, would be regarded as perfectly natural, viewed in the light of other facts relative to the distribution of disease. The probability that other carnivorous animals are affected by hydrophobia, and that they may communicate the disease to man, is supported by cases in which inoculation from the fox has been clearly proved. Cases are also recorded in which the bite of a racoon has caused this disease; and the badger, another carnivorous neighbour of the dog, has, according to Youatt, produced symptoms of the disorder. The bite of the horse has been also credited with its production. Youatt mentions one case of this kind, in which a groom exhibited hydrophobic symptoms after receiving a slight scratch from a horse's tooth. That the saliva of the horse may prove a medium of infection in man is by no means unlikely, when it is considered that from this animal man may be infected with another disease, namely, "glanders," which fully equals hydrophobia in its serious effects on the human frame. The poison of hydrophobia is therefore clearly to be ranked in the category of "blood-poisons," or those which produce their effects only when they are introduced directly into the circulation, and when thus mingled with the vital stream. As examples of poisons which also act in this way, may be cited the virus of serpents, or the matter derived from decomposing human tissues in a dissecting-room or post-mortem theatre. The former is introduced into the circulation by the poison-fang of the reptile, the other on the point of a scalpel or needle. One very remarkable feature in the action of these animal or blood poisons is that involved in the fact that they may be swallowed with the utmost impunity. An ounce of serpent-poison, one drop of which would produce death if introduced into the circulation through a break in the skin, might be fearlessly swallowed—provided, of course, that the lining membrane of the mouth and stomach was perfectly intact. As may readily enough

be understood, the changes, chemical and otherwise, which the virus undergoes in the mouth and stomach, render it innocuous, and when duly absorbed from the digestive system, the poison-matter will enter the circulation in an altered and harmless form. The facts just related, even when viewed apart from their connexion with the present subject, are singularly interesting as demonstrating the peculiarity of the conditions, in virtue of which a substance so deadly when placed in one situation, becomes harmless when introduced into the organism through another channel.

The tissue of errors with which the entire subject is surrounded, may be said to include the erroneous designation of the disease as far as the dog is concerned, since the term "hydrophobia" literally implies a dread of water, and the popular idea of the chief symptom in the disease is that of the afflicted animal flying from the very presence of that liquid. This idea is utterly erroneous. So far from shunning water, a "mad" dog will immerse itself in the liquid, and endeavour to drink—an act which, however, the animal is unable to perform owing to the paralyzed condition of the jaws, and from the consequent inability to swallow liquid of any kind. So also the term "rabies," indicating, according to popular notions, a state of violent fury and madness, is a misnomer as far as the dog is concerned; indeed, maniacal excitement on the part of the animal is rather the exception than the rule. As a description of the symptoms of rabies in the dog is not only a very necessary item in an article devoted to the consideration of the subject of hydrophobia, but is calculated to be of useful nature, the invasion and course of the disorder may be noticed at the present stage of our inquiries. Certain premonitory symptoms appear to mark the invasion of the disease, these indications being best marked in changes in the habits and disposition of the animal. The temper becomes sullen. The animal is restless and fidgety, and is continually gnawing or scratching some portion of his frame. Soon the symptoms of depraved appetite begin to be observed. The animal picks up and eats all kinds of odd substances, and it may be noted that presumptive evidence of the disease having existed may be found in the fact that the stomach on post-mortem examination is found to contain a miscellaneous assortment of articles which the dog has swallowed. Saliva begins to flow from the mouth, and distressing symptoms, connected, no doubt, with difficulty in breathing, and the accumulation of viscid mucus in the mouth, begin to be apparent. One very noticeable symptom is the continual working at the corners of the mouth with the paws, as if the animal were endeavouring to remove something entangled between the teeth. Paralysis of the lower jaw next sets in, and is succeeded by general paralysis of the limbs, culminating in the fall of the animal. The breathing becomes laboured and heavy; the bark is short, sharp, and unnatural; and with the occurrence of graver nervous symptoms in the form of convulsions, the animal dies at a period varying from the fourth to the sixth or even the seventh day of the disorder.

By way of comparison with rabies in the dog, the symptoms of hydrophobia in man may be briefly detailed. Here the application of the term "hydrophobia" is in the main correct enough, for the human patient has a very distinct horror of fluids. After a period of larger or shorter duration—to be more particularly referred to presently—and which may be denominated the period of "incubation," the person who has been bitten by the rabid dog exhibits symptoms of mental and general nervous irritability. After a lapse of one, two, or three days marked by these symptoms, true or active indications of hydrophobia begin to appear. Fever is present, there is difficulty of respiration, and spasmodic twitchings of the jaw-muscles, a horror of liquids, and a complete inability, notwithstanding extreme eagerness, to swallow fluids, are notable symptoms. The slightest sound or touch excites the patient; mental aberration and delirium supervene; general paralysis usually accompanies the delirium; and after an increased aggravation of all of these symptoms death occurs as a welcome termination to an existence embittered almost beyond description. Death may occur within twenty-four hours after the appearance of the more active symptoms; but a fatal issue may be delayed until the second or third day. Sometimes, however, death may be preceded by a period of comparative repose, life ending in such cases without a struggle.

(*To be continued.*)

ARTICLE IV.—*Cases of Hemiplegic Aphasia.* By W. LAUDER LINDSAY, M.D., F.R.S.E., Physician to the Murray Royal Institution, Perth.

THE following two cases of what may be denominated either Hemiplegic Aphasia or Aphasic Hemiplegia illustrate certain common and interesting features in the natural history of apoplectic paralysis on the one hand, and of aphasia and allied phenomena on the other. They illustrate, for example—

1. The frequency with which aphasic paralysis is confounded with drunkenness.
2. The sudden abolition of the power of speech, with its gradual restoration.
3. Confusion of ideas, leading to the use of unintended and inappropriate words, or to inability to spell correctly.

The first case in question was that of a young farmer in the prime of life, about 40 years of age, with whom I was acquainted, and whom I had occasion to see once during his illness. Having been at some celebration dinner in Perth, he was observed, while at the railway station on his way home, to stagger about as if tipsy. The natural inference on the part of his own friends, as well as of the railway officials, was that he was in reality tipsy, and nothing more. When, however, he reached his home, he was found to be hemiplegic. His sister, then his housekeeper, now another farmer's wife, and a shrewd, observant woman, much attached to her brother, thus described, in a letter to me, of date January 1867, certain features of his illness:—

"I daresay you are quite right in regard to A.'s illness, for I remember Dr B. saying to me, that it seemed to him that only the lingual nerves were affected. It was his *right* side that was paralyzed. At first he could not speak a single word. Then he began to speak, but never called things by their right names, and even yet he cannot utter the right word although he knows it quite well. I cannot tell you if he could write down his ideas, for he cannot hold a pen yet with his right hand, and he writes very badly with his left. He has written down addresses and such like, but nothing else. He thinks himself that he could not write *sense.*

"When he tries to read aloud, although he understands what he is reading quite well himself, he cannot pronounce the words, unless a word now and then, correctly.

"It is not the *memory* that is wanting, for from the first day of his illness he has remembered everything, and all along his head has been perfectly clear for business.

"I must tell you of a woman I know in Dundee, who had a shock of paralysis seven years ago. At first she was worse than A., for she was *out of her head.* For a very long time she could not say a single word. Then she began to utter sounds, and next a word occasionally. Up till about three or four years ago it was most painful to hear her speak. It was just a word, then a long stop, then another word, then another gasp or interval.

"I had not seen her for some time when I had occasion to go to her shop last week. She keeps a register for servants, so *her* memory too must be good. I was quite astonished to hear her speak as well as she ever did. She told me it was only last summer, and the summer before, that the change for the better came, and she attributed it to having gone north each of these summers for change of air. She herself thought it was merely nervousness and general weakness that had prevented her speaking. The funny thing in her case is, that although her hand—the *right* one here too—is as sound as ever, and she can write quite well, she *cannot spell* a single word properly—not even her own name! She has a method of her own of counting, but a queer one.

"This woman has been perfectly well for years, and has had either one or two children since her illness.

"A. took comfort to himself when I told him how well this person was now. A. is certainly greatly better, can walk almost any distance, and can pick up a little thing with his right hand. I hope he will come all right soon."

This sisterly hope, however, was doomed to a sad disappointment, inasmuch as another apoplectic seizure terminated fatally.

This gentleman's mother, a spare-built, intellectual woman, though also a farmer's wife, had died some years previously suddenly by apoplexy at a comparatively early age—about fifty. His father, on the other hand, who in his youth had been locally celebrated as an athlete, and especially as a horseracer and steeplechaser, was a signal instance of rapidly fatal enlargement of the spleen, attended with that condition of the blood described by the late Professor Bennett as *leucocythæmia*. His death occurred in 1852, at a time when, in consequence of Professor Bennett's researches on so-called *white cell-blood*, this morbid condition of the spleen and blood was attracting notice among the rising generation of scientific physicians—those accustomed to the use of the microscope and test-tube.

The physicians of Dundee who attended this patient obviously had not the remotest idea of the nature of his illness until it was pointed out to them. It so happened that at the time I was one of the resident clinical (medical) clerks in the Royal Infirmary of Edinburgh, where I had under charge a most interesting and typical case of enlarged spleen, with white cell-blood, in a soldier who had probably visited aguish countries. Having occasion during a holiday to see the farmer patient near Dundee, I had no difficulty at first sight in pronouncing on the nature of his illness, and I suggested that his relatives should communicate on the subject with his ordinary medical attendants, and that they in their turn should consult Professor Bennett. All this was duly done, and a specimen of the patient's blood was submitted to that distinguished microscopist for his opinion. The result was ample confirmation of the correctness of my surmise, and, if I mistake not, the case figured in the subsequent publications of Professor Bennett and others on *leucocythæmia* as one of the best-marked instances thereof that had been anywhere met with.

ARTICLE V.—*Notes of Cases of Spinal Curvature treated after Dr Sayre's Method.* By GEO. C. PIRIE, M.D., Dundee.[1]

THE attention of the medical profession has very recently been directed to the subject of spinal curvature, from the novel and very efficient treatment introduced by Dr Sayre, of New York, a treatment which in his hands has been accompanied by most favourable results, and which has proved equally successful in the hands of others who have adopted it.

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[1] Prepared for the Annual Meeting of the Forfarshire Medical Association, held at Forfar 11th July 1878, but for want of time unread.

When we consider the nature of spinal disease as regards the pain, ill health, and deformity it occasions the sufferer, as well as the prolonged confinement and the varied mechanical appliances hitherto deemed necessary in its treatment, and withal the unsatisfactory results too often found of such treatment, we cannot but hail with much interest and satisfaction a method which is simple, easy of application, and so satisfactory in its results. To Dr Sayre the profession owes a debt of gratitude, not only for his important discovery, but for the open and generous manner he has taken to introduce it to the notice of his medical brethren, having, besides publishing an excellent and lucid work on the subject, publicly exhibited his method of treatment at various hospitals in this country. Like other practitioners, Dr Sayre had his time of spinal braces or supports, but was oftener pained than pleased with the result of their use. In the year 1874, he first tried suspending a subject of spinal curvature, and encasing him with a plaster-of-Paris jacket, and was so struck with the good effects of this treatment, that thereafter this method was followed by him in all cases of spinal disease.

Before submitting to this meeting some brief notes of cases of spinal disease, which I have lately had the opportunity of treating by the new method, I would take the liberty of explaining that Dr Sayre's mode of suspension is effected by an arrangement of straps adjusted to the neck and to the armpits. These are connected by rope and pulleys to a hook in a tripod on the ceiling, and thereby the patient is slightly raised off the floor. While the body is in this extended position, it is wound round with plaster-of-Paris bandages. These being applied in a moist condition, readily set, and form a firm shell or jacket, which keeps the spine in its improved position, and very comfortably supports the body. By this method the deformed spine is straightened, pains long complained of are removed, and a start given to an improved figure and condition of health. If the curvature is recent, the disease by this treatment may be entirely removed; if of several years' standing, it still admits of improvement.

The cases which I have thus personally treated have been both the posterior angular and the rotary lateral. Some of them were quite recent, others of many years standing, and their ages varied from 4½ to 22 years. In all of them there has been improvement, and in some entire removal of the deformity. Where pain and ill health existed previous to suspension, thereafter freedom from pain and an improved state of health resulted.

Cases of Posterior Angular Curvature.

CASE I. shows the treatment by the old and by the new method. —J. S., æt. 6½ years, the daughter of healthy parents, after an attack of measles and bronchitis in 1875, and bronchitis again in 1876, was left in rather delicate health, and during the end of latter year began to complain of pain over stomach and sides of body. She was noticed to walk awkwardly, and that body was slightly inclined to right side, with drooping of right shoulder. No history of injury.

On the 11th January 1877, when I was first consulted as to her spinal trouble, she showed a delicate and weary look, complained of lateral pains, and her body inclined to right side. There was no spinal knuckle, but a slight lateral curvature in lower dorsal region. She had been sleeping badly before this time, and had always felt relieved by lying.

She was ordered to assume the recumbent position, with a tonic regimen, and in about three weeks after adopting this treatment, a fulness was observed over the eleventh dorsal vertebra, which afterwards involved the tenth and twelfth vertebræ as well. She lay for three months, and then had a spinal brace fitted on, which gave her support; but the spinal deformity increased notwithstanding. She was at this time quite able to walk about, and so continued until about the middle of January 1878, when she had a slight fall on the floor, which greatly aggravated the spinal disease. The dorsal knuckle became tender and painful, pain shooting upwards to head and downwards to right leg. She rapidly became unable to stand or walk, and movements in bed greatly intensified her suffering. These symptoms after a time somewhat subsided, and at the suggestion of Professor Annandale of Edinburgh, I adopted on the 4th March 1877 Sayre's treatment, and encased my little patient.

Before suspension she was unable to stand or walk, and the dorsal knuckle was very prominent. After suspension the knuckle was smaller; she was able to stand, and with help to walk a few steps, and in the evening of same day to sit on a chair. From this time onwards improvement was marked and uninterrupted. On the second day after suspension her appetite and general health were improved. On the 9th March her mamma reported that her daughter's "state shows decided improvement from the treatment of Monday, and she is able with help to walk a little these past two days."

3d April.—Patient is much improved, and is now walking without assistance. No pain at spinal curvature or neighbourhood.

27th June.—Is still walking with every freedom, and without pain; feels much supported by plaster jacket, and is looking more healthy, and is eating and sleeping well.

Case II.—A. B., a girl 4½ years of age, has a posterior angular curvature of fifth and sixth dorsal vertebræ, causing much deformity of the body, with pain at seat of curvature. Is a delicate child, and stoops much. Can walk alone, but is easily fatigued, and beginning to support her body by resting her hands on thighs. Is restless at night, and sleeps badly. Has worn a brace for about eighteen months, but knuckle has steadily increased. Has been ill two and a half years.

8th June 1878.—I suspended her to-day, and encased her with the plaster jacket. A marked straightening of the spine was immediately observed, and the height of body was increased ½ inch.

18th June.—Her father informed me to-day that his little daughter is walking better and straighter, and is much more lively than before operation. Is not disposed now to rest her hands upon thighs.

24th June.—Improvement continues. She is sleeping and eating better, and giving her mamma an opportunity of getting sleep, of which she had little for weeks past through her child's restlessness.

CASE III.—H. C., æt. 9, has a posterior angular curvature of upper lumbar vertebra, which began to develop about two years ago after scarlet fever. After the usual course of suffering attendant on spinal disease in its earlier stage, he still has pain at spinal knuckle and down left thigh. Sleeps badly, and has pain somewhat acutely on awakening from sleep. Can walk, but is getting much deformed.

20th June 1878.—I suspended him to-day, and applied a plaster jacket in the usual way. Felt comfortable in jacket, and was half an inch taller after suspension. Walked home with ease, and slept better that night than he had done for weeks previously.

3d July.—Figure improved; pain in back and thigh have not returned since suspension, and to-day he is preparing to set off to his home in England.

CASE IV.—G. C., æt. 22 years, fell downstairs when about five years of age, and shortly afterwards a posterior angular curvature formed of first and second lumbar vertebræ. She had a period of suffering, bad health, with spinal deformity, and when twelve years of age got a spinal brace, which, with renewal, she has worn up to the present time, March 1878. She has a short, squat figure, and a considerable fulness over left haunch, together with a well-marked posterior angular curvature of first and second lumbar vertebræ. Complains of pain in left side, and cannot sit comfortably when wearing brace, as hands "sleep."

10th March 1878.—I suspended her to-day, and applied a plaster jacket. Felt comfortable in her shell, and discovered that her side pain had quite left her. Shortly afterwards she was able to sit with comfort, and to walk with greater ease than she was ever able to do before suspension. Her figure considerably improved, and on the 27th June she felt so well that at her own request I removed the plaster casing. She expressed much satisfaction at the improvement effected in her health and figure.

I have given the above as examples of the posterior angular curvature, and in each the benefit from suspension and encasing was very speedy and satisfactory. The cases I would now shortly narrate are examples of the rotary lateral curvature. In these the body droops to one side, and at the same time becomes rotated on the vertebral axis, producing often a very unpleasant deformity, with suffering and ill-health, as in the posterior angular curvature. The rotary lateral curvature is amenable to treatment in the same way as the angular curvature. In cases of recent disease the good effects of Sayre's treatment are generally very speedy and marked. In more advanced cases the good effects are slower in developing. In both the first suspension and encasing are to be followed by daily suspension, continued, it may be, for several weeks or months. By perseverance in this way a decided straightening of the spine may be looked for, with improvement of health and strength.

Cases of Rotary Lateral Curvature.

CASE I.—L. L., æt. 12, a tall, delicate, and rather nervous young lady. About seven months ago, through the breaking of a branch of a tree, she was left suspended by one arm, and on being let down she complained of pain in left shoulder and side, and in two or three days afterwards was noticed to be walking awkwardly, and to be leaning over to left side. This was the beginning of a rotary lateral curvature, which speedily increased, rendering her so feeble and helpless that, after four months from the date of injury, she became unable to stand or walk, and for fully three months longer she was an invalid confined to the bed or sofa. I saw her at this time in consultation with her medical attendant, Dr Wemyss, Broughty Ferry. The rotary lateral curvature was well marked. She could not leave the couch, where we found her lying, without assistance, and she was equally unable to stand or walk. A constant pain was complained of in left shoulder.

I advised Sayre's treatment, which was carried into effect on the 28th March 1877, Dr Wemyss being present and kindly assisting at the operation. There was immediate and marked straightening of the spine, and a lessening of the shoulder pain. Daily self-suspension was now recommended, but from a cold caught shortly after the operation in March, this could not be commenced with until the 15th April. As to her progress since this time, Dr Wemyss informed me on the 21st June that "her course has been one of steady improvement. She can now walk about a good deal, both in and out of doors, and when I saw her last week she was preparing to set off on a visit to a friend in the neighbourhood of Edinburgh. Her general health is much better, and her pains are nearly gone. The jacket has kept firm, and continues to give her good support, and she has been most persevering in the exercise of self-suspension."

CASE II.—W. S., æt. 6½, son of healthy parents, had a marked rotary lateral curvature which had been observed developing for only three weeks previous to my seeing him. There was no history of injury. His left shoulder drooped considerably, while the right side of chest was bulging forwards, and the left one much flattened.

3d April 1878.—I suspended and encased him to-day, whereby the figure was much improved and the walk made more erect.

Daily suspension was enjoined, and when last seen in the end of June the improvement was very marked, and his health good.

CASE III.—C. H. T., æt. 8 years, the daughter of healthy parents, had a fall about three years ago, in consequence of which she was for some weeks confined to bed. During past five months has been getting high shouldered, and more recently has been noticed leaning over to right side. General health has of late been indifferent; sleeps badly, and is easily fatigued. Complaining of pain about back, head, and thighs.

7th June 1878.—Was suspended, and had a plaster jacket applied to-day. Felt quite comfortable in jacket, and stood ¼ inch taller after suspension. Her figure also was much improved. She slept better the following night than she had done for months previously, and the pain about back, head, and thighs was found to have ceased. Was enjoined to use self-suspension daily.

CASE IV.—A. K., æt. 7½ years, fell two days ago heavily on his left side, and on getting up felt pain in shoulder of same side. Has slept badly since fall. I saw him on the second day after his fall, when there was much drooping of left shoulder, with pain and difficulty in raising the arm. There was no dislocation or fracture about shoulder-joint, but a marked curvature of cervical and upper dorsal vertebræ to right side was readily observed, and this, his father assured me, had developed since the fall two days before. On the following day he came to be suspended, and the lateral curvature was found to have greatly increased in the interval.

25th June 1878.—I suspended and encased him to day, after which he stood upright, with the left shoulder raised to the level of right. Feels comfortable in jacket, and is ½ inch taller since suspension. To rest in bed for two days, and afterwards to use daily self-suspension. This was done, and on the 9th July I found him walking about with ease, and with a figure greatly improved by the treatment of the 25th June.

These cases of spinal curvature, with others which I have treated in the same way, show the good results of Dr Sayre's method of treatment by suspension and encasing, and I venture to say that, were the same method adopted in all recent cases of spinal disease and curvature, much suffering and ill-health would be avoided, and the spinal deformities which we see too frequently on our streets would be almost unknown.

ARTICLE VI.—*Case of Unreduced Pott's Fracture Remedied by Operation.* By W. A. FINLAY, M.D., F.R.C.S.E.

A. D., æt. 35, was admitted into Leith Hospital suffering from the effects of an injury to his right ankle. The history of the case previous to admission is somewhat remarkable, inasmuch as the patient did not obtain surgical aid, although his ankle had been so seriously injured. On the 24th of December 1877, he was thrown down in a scuffle and sustained what he supposed to be a sprain of the ankle. He sent to a dispensary soon after the accident, but as his house was beyond the limits of the district to which it was the duty of the dispensary officers to attend, he failed to obtain the necessary aid. In consequence of this, the injury received no treatment beyond hot fomentations and bathing, until the fifth week after the date of the accident.

On admission the patient was found to have sustained fracture of the right fibula above the ankle, with great displacement of the foot outwards. The fracture was firmly united, and the foot immovably fixed in its abnormal position.

The internal malleolus had caused distinct thinning of the skin which was stretched over it. So much was this the case that a little more pressure would have converted the dislocation into a compound one. As may be readily imagined, the patient was in a very helpless condition. Not only was he unable to walk, but he could not bear the weight of his body on the foot.

On the 23d of January, the day after he had come under my care, and one month after the occurrence of the accident, I had the patient put under chloroform, and found that by using all justifiable force only a slight improvement could be effected in the position of the joint. Some adhesions were felt, and, indeed, heard, to give way, during this attempt to replace the foot.

The fracture had united at an angle, the apex of which was pointed towards the tibia. The firmness of the union was evidently the obstacle to the complete reduction of the dislocation.

Under these circumstances I made an incision over the seat of the callus, and having cleared the bone at the part, divided it with cutting pliers. After this the foot was easily put into its normal position. A well-padded Dupuytren's splint was then applied, and bandaged in the usual way.

Lister's antiseptic method was carried out in the case. The wound was at first dressed every day. Latterly a week was allowed to elapse between each dressing. At the end of the fourth week the wound was quite whole, having been aseptic all the time. The splint was kept on for seven weeks in all.

The result was excellent in regard to the position of the foot and union of the fracture. The patient by walking gradually overcame the stiffness from which the ankle suffered after removal of the splint.

Fortunately cases like the above are not common. The carelessness on the part of the patient and his friends, which resulted in the failure of their efforts to obtain advice at the proper time, can only be accounted for by the fact that they overlooked the gravity of the injury, and that they were blamably indifferent in regard to it. On the other hand, I may mention that I have seen a patient walk across a stone floor within an hour after suffering fracture of the fibula with displacement of the foot outwards; and it is, perhaps, not much to be wondered at, that a man, finding he is able to walk, should conclude that his leg is not broken, more especially as the subsequent swelling of the joint would tend to hide the distortion.

After the lapse of how long a period would it be proper to interfere by operation in a case of unreduced Pott's fracture? There are not a sufficient number of cases on record to admit of a definite answer being given to this question. It is said to be improper to attempt to reduce a dislocated shoulder after the lapse of eight or nine weeks; but in the case of the ankle, a much longer period might be taken as the limit, seeing that the dislocation is only partial, and the articulating cavity is so much deeper.

ARTICLE VII.—*Notes on a Case of Umbilical Urinary Fistula.* By FRANCIS CADELL, F.R.C.S. Ed.

CHRISTINA POTTS, the subject of these notes, was a delicate-looking child of eight years. From earliest infancy her mother noticed that the child was troubled when passing water. Desire to micturate was frequent, while the quantity of urine passed was very small. When she was six months old, the lower part of the abdomen, including the genitals, became black and blue; the discoloration, however, after a little disappeared. When four years old the girl went to school, but on account of pain and the frequent necessity to pass water, it was found impossible to keep her there. She was therefore removed and kept at home. Two years ago she had a severe attack of typhoid fever, and from this time the bladder symptoms increased in severity. Eight months ago some blood was noticed to come away with the urine. On 27th November 1877, after a few days of great pain, with swelling and hardness of the belly, urine was observed to come in a small stream from the navel. The case was seen by one of my pupils at the New Town Dispensary. I saw the patient at his request on 18th December.

On examination, there was nothing abnormal in the appearance of the umbilicus or genitals. At the centre of the umbilical depression there was a fistulous opening. A probe was easily passed into this opening, and onwards into the bladder. On passing a No. 2 elastic catheter by the urethra into the bladder, the eye of the catheter was immediately blocked up by tenacious muco-purulent masses. The urine came freely away when the catheter was introduced through the fistula. The urethra appeared normal in every respect.

20th Dec.—No urine had passed naturally, but it had flowed freely by the umbilical fistula. Chloroform was administered, and without difficulty I passed a No. 8 silver catheter into the bladder by the urethra. A small quantity of offensive urine came away; but almost immediately the eye of even this large instrument was blocked up by tough muco-purulent masses. Several of these masses were removed by the catheter.

21st Dec.—No urine by urethra. Washed out the bladder with Condy and tepid water, and got away several large tenacious masses from the bladder. There is a considerable quantity of pus mixed with the urine.

22d Dec.—No urine by urethra. Wishing to produce incontinence in order to relieve the cystitis, and also to assist the urine to flow naturally, I dilated the urethra with a metal instrument, originally intended for dilating the cervix uteri. The washing repeated.

23d Dec.—The dilatation has had no effect. The urine flows so easily through the umbilicus, that the very slight resistance at the neck of the bladder is not overcome.

3d Jan. 1878.—Through the kindness of Dr Halliday Croom, I got the loan of a set of Professor Simon's urethral dilators. I found them a great assistance in washing out the bladder, and they were most efficacious in inducing incontinence of urine. On this day I introduced, under chloroform, Nos. 1 and 2 dilator. In a few days I introduced No. 3, after which my little finger was passed, with slight difficulty, into the bladder. This produced permanent incontinence, thus stopping in a great measure the passage of the urine through the fistula. Under the treatment of regular washing out of the bladder, the urine improved in appearance, lost its offensive smell, and became comparatively free from pus. No more of the tenacious masses, which used to block up the eye of the catheter, were seen. From what I could feel with the end of my little finger of the internal surface of the bladder, it seemed fairly healthy. The wall felt thickened and contracted. There was no abnormal obstruction of any kind at the neck of the bladder.

27th Jan.—Incontinence continues. When the child is lying down, the navel remains dry; but when she sits up, urine is found to flow from it, showing that the slightest pressure on the urethra is sufficient to divert the urine from its natural passage.

7th Feb.—Water flows freely by urethra. For the last few days the child has stayed in bed, feeling weak, p. 116.

9th Feb.—The legs and feet have become œdematous, p. 120, temp. 101°·6.

14th Feb.—Temp. 101°·2. Urine flows naturally. There is a feeling of solid œdema over the bladder. Will take hardly any nourishment, to get some wine.

21st Feb.—Condition has improved. Œdema of legs and lower part of belly has disappeared; temperature normal.

26th Feb.—Under chloroform, passed my little finger into bladder to keep up incontinence. Found urethra contracting slightly. The funnel-shaped entrance of urachus could be felt, and admitted the tip of the little finger. The child is now very emaciated.

From this date the little patient gradually became weaker, was troubled with recurrent attacks of vomiting, and during the last week of her life almost nothing remained on her stomach, and she died exhausted on 16th March.

The post-mortem examination was kindly made for me by Dr Wyllie, whom I have to thank for the following report of the appearances:—

"*17th March* 1878.—Twenty-seven hours after death.

"*External Appearances.*—Body extremely emaciated, ribs standing out very prominently, and muscles of limbs much atrophied. Rigor mortis and post mortem lividity very slight. No œdema of any part of the body, and no tumidity of the abdomen. At the umbilicus there was the opening of a fistula from which urine had escaped during life. A probe could be passed along this fistula into the bladder. The umbilicus itself was natural, and the fistulous opening presented no fungation or induration of its margins. The fistula seemed large enough to admit a No. 5 or 6 catheter. There was slight abrasion over the perinæum from urinary irritation. The urethra was greatly dilated.

"The anterior wall of the abdomen, including the skin at the umbilicus, and the bone of the symphysis pubis, was removed, along with the pelvic organs, ureters, and kidneys, without severing the connexion of these parts with one another. On careful examination the following was found to be the condition of these parts:—

"*The bladder* was rather contracted, its cavity being capable of containing only three drachms of fluid. There was great thickening of the mucous and submucous coats, this thickening being irregularly distributed, and resulting in the protrusion into the cavity of rounded nodules the size of peas, these seeming to be rugæ of the mucous membrane swollen and fixed in their form by inflammatory infiltration. The whole mucous surface was deeply congested, and somewhat pigmented. In some of the nodules there were patches of extravasated blood, and on the surface of one or two there was superficial ulceration. At the superior anterior extremity or apex of the bladder there was an opening into the unobliterated urachus capable of admitting the point of the little finger. This was continued upwards to the umbilicus in the form of the fistula above mentioned. It became graduall narrower till at the umbilicus it was, as already said, only capabl of admitting a No. 5 or 6 catheter. The mucous membrane of th urachus was thin and pale, contrasting markedly with that of th bladder. Its surface was dotted over with small points of yello caseous pus. Between the umbilicus and bladder there were ol peritonitic adhesions of the omentum to the anterior wall of th abdomen, along the course of the urachus. There were also ver dense adhesions binding the uterus to the posterior wall of th bladder.

"The *right kidney* was enlarged to about twice its natural siz but on being cut into was found to be a mere bag of thin-walle cysts filled with putrid and ammoniacal pus. These cysts ha resulted in the usual way, from the dilatation of the pelvis and it calyces by accumulation of pus and consequent atrophy of th kidney substance. In this case the atrophy was complete, th cyst walls being quite thin and fibrous, and without any trace o secreting substance.

"The *left kidney* was about a half larger than the natural size. In it, as in the right, the pelvis and its calyces were distended with putrid pus, but the destruction of the kidney substance was not so far advanced. It was noticeable that in this kidney the destruction was much more marked in the pyramids than in the cortical substance; the majority of the pyramids having the lower or papillary half of their substance completely destroyed, and some of them being altogether destroyed, with the exception of their broad or basic extremities. The destruction looked as if it had proceeded from ulceration, its limits being abrupt and marked by a rim of caseous deposit. The cortical substance of the organ was somewhat atrophical, and was speckled and streaked by fatty intratubular deposits. The capsule of the organ was natural, and could be stripped off easily. The subcapsular surface presented a puckered and nodular, but not granular, aspect. *Note.*—In both organs there were among the pus of the pelvis and its calyces a few small gritty phosphatic deposits.

"On both sides the *ureter* was dilated, so as to be about a half larger than a goose-quill. The muscular coats were much hypertrophied, and their mucous membrane was here and there dotted with small caseous deposits.

"The other organs of the body, with the exception of the brain, were carefully examined, and found to be healthy."

Cases of umbilical urinary fistula are of rare occurrence, especially so when not congenital. The following are the only references I can find of similar cases to the one I have described:—

Mr Savory (*Medical Times and Gazette,* vol. ii., 1852, p. 106) reports the case of an infant with *open urachus* and umbilical fistula. At the post-mortem examination a growth was found at the neck of the bladder obstructing the natural passage, and so

forcing the urine into the still open urachus, and producing fistula. Mr Bryant (*Medical Times and Gazette*, vol. i., 1862, p. 456) describes the case of a boy, æt. 8, with *open urachus*. Had a discharging orifice at umbilicus (congenital) which caused much inconvenience. A peculiar projecting mass about the size of, and not unlike the boys' glans penis, was visible, with an orifice corresponding to the urethra at its extremity—orifice constantly moist with urine. Mother refused to place the boy under hospital treatment. There was little doubt this was an unobliterated urachus. Mr Thomas Paget (*British and Foreign Medical Review*, vol. ii., 1862, p. 86) has notes "On an Operation for Pervious Urachus." In a man, æt. 55, in whom he had removed a ring-shaped calculus through the urachus, passing the finger into the bladder. Has since closed the opening in the man's case, as well as in another, an infant's. Operated as for hare-lip with success.

Mr T. Smith (*Medical Times and Gazette*, vol. i., 1863, p. 320) describes the case of a boy, æt. 2, with *open urachus*, with papillary projection of umbilicus, urine exuding; ligature applied to protrusion. In a few days it fell off, and fistula seemed permanently closed.

In the case of Christina Potts, the urachus must have been partially open from birth. This condition, by preventing the bladder from emptying itself, had brought on chronic cystitis. The cystitis, again, had increased the difficulty of passing water, and so had aided the gradual dilatation of the partially open urachus, until the urachus gave way altogether and became a urinary fistula. I believe also that the tenacious muco-purulent masses found in the bladder had a good deal to do with obstructing the natural passage.

The treatment by dilatation of the urethra was directed to the relief of the cystitis by inducing incontinence of urine—a plan of treatment recommended by the late Professor Simon of Heidelberg—and also to see whether, by directing the urine along its natural channel, the fistula would show any tendency to close. The cystitis was, no doubt, benefited by the dilatation of the urethra and regular washing out of the bladder; but I doubt if the induction of incontinence, however perfect, would have been sufficient to allow the fistula to close, without operative measures. The condition of the bladder and urachus, found post-mortem, was very much what I had ascertained to be their state during life.

ARTICLE VIII.—*On the Etiology and History of Leprosy.* By W. MUNRO, M.D., Manchester, late of London.

(*Continued from page* 140.)

Race.—Some have supposed that certain races have less tendency to the disease than others; thus the Arabs of the Malay Archipelago being free from it is supposed to be partly so accounted for,[1] but as the settled Arabs of Algeria are stated to be more affected by it than the Kabyles,[2] *race* can have nothing to do with their exemption in Java and adjoining countries. The reason already mentioned—their separation from other infected races—is more satisfactory. Europeans, again, are supposed to be more exempt than black races;[3] but Carter himself, the chief author depended on in the College of Physicians' Report, in support of this idea, has now changed his former opinion as to its unfrequency, as he ends his last report (1876) with a short chapter on "Leprosy in Europeans in India," in which he speaks emphatically of the liability of Europeans to leprosy, and mentions six cases known to him in Bombay "without in any way pushing inquiry," while "it is known that there are others." But as the total number of Europeans in the Presidency of Bombay is only 28,900,[4] including 10,121 soldiers[5] (among whom the disease certainly appears to be almost unknown, *not one instance having occurred that I have been able to hear of* although they may be sometimes affected);[6] and the six known cases appear all to have been civilians, and these six are only a few in the *town* of Bombay, representing an *unknown number* scattered throughout the country; and as even these six would give 1 in 3100 of the 18,779 civilians in the Presidency, while the proportion in the whole population is 1 in 1982, it is evident that there is really no immunity of Europeans, though such might appear at first sight to be the case from their relatively small numbers in the country.

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[1] Liveing, p. 66.

[2] Dr Ch. Claude Bernard, private letter.

[3] Coll. Phys. Rep. pp. 110, 116 (Carter and Stenhauser), and 158.

[4] Census, p. 260, the Christian population of Aden (Tab. 4, p. 367) being deducted.

[5] Army Medical Rep., 1873.

[6] If this were made a matter for special statistical inquiry, which could be easily done, it would be another strong argument in favour of the contagiousness of the disease, soldiers in India, though living in the country, being *more thoroughly isolated* from the disease than any other class, the native servants in attendance on them being at once dismissed on showing any signs of disease, and the Contagious Diseases Act being fully carried out in regard to the native women with whom they come into contact, while they themselves avoid cases with perfect horror. Some years ago the natives of a leper village near Jansi caused a perfect stampede of all the troops into their barracks by walking through the square. On the other hand, instances are known of *officers* being affected (Coll Phys. Rep., 104, 238, and 241), they having more freedom, and cohabiting with any one they choose. One case was so caused.

On a wider scale, again, the whole British population of India, soldiers excepted (of whom there were 55,425), as shown in the census returns, was 66,155. Now, from various sources I have easily collected twenty-seven cases, arising among that population during the last quarter of a century,[1] representing, of course, only a part (possibly small) of those actually affected, which may be looked on as more than a counterpoise to the fact that all these twenty-seven were not living at one time; yet this number alone gives 1 in 2459, which, considering that the data are so very incomplete, although positive so far as they go, speaks little for any immunity existing among Europeans. The same remarks apply to Europeans in the Dutch East Indies, from which Landré (p. 5) says he has seen about ten cases, and to the West Indies.[2] In St Kitts, I knew of one case in a planter, and have heard of one in a judge, a Scotchman, and I saw three cases (brother, sister, and cousin) in *poor whites*, children of parents who came from Sussex; and I heard of the *recent* death of two Englishmen (brothers), labouring men. This, out of a total white population of about 800, shows no immunity; the numbers are too small to argue from, but, so far as they go, show even a higher proportion than the 1 in 389 of the whole population. The same want of comparative statistics makes the statements as to the smaller number of whites than blacks (relatively) affected in the Cape and the Mauritius of no value.

The Jews in Bombay were stated by Carter to have been exempt,[3] or nearly so, he having *only* known of four cases, but as there are only 2500 Jews in Bombay, the proportion is after all quite high enough—higher, indeed, than in the other populations. T. Fox mentions[4] that it is said "there is no known case of leprosy in a Hebrew at the present time in Syria." That this is not a question of race, however, is shown by his own views as to modern being included in the Mosaic leprosy as one of its forms, by the history of the disease, by its being more prevalent (as far as known) among the Jews of Cairo[5] than among the other races, as is also the case in Jamaica.[6] It is known also in Asia Minor as the Judamata or Jews' disease.[7] The most probable explanation of the extinction or rarity of the disease among the Jews of Syria is, that the segregation enforced by the Mosaic law, combined with the persecutions the people have undergone, and their scattering abroad, during which those actually diseased and outcast would necessarily be neglected and starved, have stamped out the disease from among them. Under the head of history I might have observed, but do so here, that on a comparison of the writings of the Jewish traveller, Benjamin of Tudela (1160–73), in Western Asia and Europe, with notices of the places in which leprosy was most prevalent in the Middle Ages in Europe, and still remains so in Persia, that the very places where he mentions the greatest number of Jews, as in Samarkhand[1] (50,000 Jews), are or were the most affected by leprosy. From these, therefore, as well as from other examples mentioned in the history, it is clear that no race as such is ever exempt or likely to remain so from leprosy so long as, under favourable conditions for communication of the disease, an already affected race is brought into contact with it. At the same time, it is possible that there may be a greater tendency for the disease to *originate* among the negro races than others, and races most in contact with them are most infected, as in Morocco, a country in which the negro race dies out, but where an enormous importation of them has continued for centuries,[2] and where all races are consequently infected to a great degree.

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[1] Coll. Phys. Rep., pp. 81, 104, 158, 235 to 243 (15 cases); Hutchison, *op. cit.*, p. 96.; Carter, 1876, Report, p. 36 (10 cases); and one case seen at the Edinburgh Med. Chirurg. Soc., in 1874, from Rungpore.

[2] See Milroy, Rep., p. 2; Coll. Phys. Rep., pp. 45, 46, and 85; also Brassac's Rep. (several cases); Guy's Hosp. Reports, 1859, p. 141.

[3] Coll. Phys. Rep., p. 110.

[4] *Ed. Med. Jour.*, vol. i., 1866, p. 802.

[5] Coll. Phys. Rep. p. 53.

[6] *Ibid.*, p. 12. (One of the cases mentioned in Guy's Hosp. Reports, 1859, is that of a Jamaica Jew.)

[7] *Ibid.*, p. 69.

Having thus considered the chief causes which have been supposed to have some connexion with the mode of origin of leprosy, I may be permitted to mention what, from my study of the history of the disease, I consider to be a most likely *causa vera,* possibly capable under favourable circumstances of causing the disease to arise *de novo,* after which it is propagated by contagion.

We have seen that the disease had, so far as history can teach us, two great centres of origin, Northern Central Africa and India. Now, it appears to me *that it is in the conditions obtaining in those centres of origin,* and specially in such conditions as differ from those obtaining in all other parts of the world, and more particularly in such conditions as those centres agree in, that we ought to look for the causative influences of leprosy, and *not* in the conditions of life in countries into which it has been imported and spread by contagion. Now, in India as in Africa, *want of salt, combined with the use of vegetable food,* are the prevailing characteristics of the diet of the mass of the people, and, as I have already said, what is the state of the population, has been so in India[3] and Africa for ages.

As to Africa, this great want is increased by the want of convenience for carriage, so that to some parts it has to be carried 700 miles chiefly on men's heads. Du Chaillu[4] mentions that among the Apingis, an inland equatorial tribe, it is so scarce that ten pounds will buy a boy slave. Parkes[1] mentions that a cake of salt, 14 × 2 × 2½ inches (containing about 70 cubic inches), which had been brought from the salt mines in the Sahara to the Niger country, costs usually two pounds or more. While Caillé[2] speaks of such cakes at Jenné, brought 650 miles inland by the Foulahs, as costing equal to four pounds; and there, Jenné being a large town, it is considered "common enough, obtainable by every one;" elsewhere, throughout the country, only the *very rich* were ever able to taste it. Bonnat, lately a prisoner in Ashantee, speaks, in a paper read before the *Société de Geographie Commerciale*, of its being very dear at Selza, in Ashantee, where it costs five pounds (125 francs) a ton. But Selza is only about 130 miles from the coast.

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[1] Kerr's Collection, vol. i. p. 102, etc.
[2] Sultan Muley Ismail (1727) imported 100,000 in a few years.
[3] Census of N.W. Provinces, p. lxxiii.
[4] *Lib. cit.*, pp. 456 and 289.

In India the same want is felt by millions. In the Census of the North-West Provinces[3] it is stated that the "small farmer eats salt every day or two days, the labourer once in eight days, or in small quantities occasionally;" and it must be remembered that in one part of these very provinces, at Jansi, there are salt mines, but *from the great difficulty of carriage* it is too dear for labourers to obtain; as Dodd says,[4] "it may be confidently said that the Government which would place within reach of the poor cultivators (of Hindostan) an ample supply of salt would be sure to receive the blessings of millions." It is nothing uncommon for cargoes of salt to be sent from London to Calcutta. The want of good roads has been the curse of India.

Since my attention has been turned to this point some years ago, I have made it a special object of study, and can unhesitatingly assert that in no part of the world, as at present known, is the same scarcity, combined with a vegetable diet, observed, with one remarkable exception, New Zealand, where the natives do not use salt,[5] and where, *in the interior*, in former times, when every tribe was at constant war with its neighbour, it was impossible for the tribes of the interior, *the very place where Thomson saw Ngerengere*, to obtain salt in any form.[6]

In South Africa there is salt in the Kalahari Desert; and among the Bakwains, though it is scarce, meat is plentiful.[7]

In Southern Central Africa, as may be gathered from Livingstone's Zambesi and Last Journals, while it is abundant in some places, as in the Nyanza Country and to the south of Tanganyika, it is less obtainable in others, but at no spot has it to be carried more than 200 miles.[1] It is extracted by the Manyuema from grass roots. I observe also that Livingstone chiefly remarks on a want of it when at a distance from the great centres of population, as, on reaching Lake Nyassa after a journey from the Rovumma, and when two-thirds of the way between Nyassa and Tanganyika.[2] Besides, in Southern Central Africa *animal* food is much more abundant than in the north.

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[1] *Lib. cit.*, p. 305.

[2] "Travels through Central Africa," p. 465. Leared also (p. 193) speaks of its being sent from Morocco to Timbuctoo.

[3] P. lxvi. [4] *Lib. cit.*, p. 104. [5] Savage, *lib. cit.*, p. 60.

[6] I have already spoken of leprosy existing among the Fijians; it is worthy of note that they also *will not* use salt.—*Two Years in Fiji*, by Litton Forbes, M.D., p. 189.

[7] Livingstone, "Travels in South Africa," pp. 77 and 133.

In regard to the rest of the eastern world, unlike Africa (which, as Livingstone says, is the oldest continent in the world, not having been repeatedly the basin of a great ocean, as Europe and Asia have been), it is, at least north of the Himalayas, abundantly supplied with salt. The great plain of Europe and Asia, from the shores of Holland to the Yellow Sea (of which, indeed, the Sahara Desert itself is only a branch extending to the south-west), is one vast upheaved ocean bed, over which salt is necessarily scattered everywhere, as at Berchtesgaden in Bavaria, Wrielizka and Bochnia in Poland, Louvra in Hungary, Hallem in Upper Austria, and also in Catalonia in Spain, and Altemonte in Calabria, on the Steppes, in Transcaucasia, in the salt marshes to the south of the Caspian in Persia, as salt plains and wells in Thibet,[3] in the Tartar Desert,[4] and in the interior provinces of China, as Yunan,[5] as well as in Siberia at Okhotsk.[6] Thus, apart from the supply from the sea, there is no lack of salt in the interior of the old continents, and the carriage of it has always been easy in Europe, while in Central Asia it is so thickly scattered that carriage could hardly be said to be required, and horses are plentiful.

In the New World, in North America, west of the Rocky Mountains, most of the tribes have been animal feeders, and there has been no want of salt, it being found on the Alleghanies, in numerous salt lakes over the prairies, and in the Great Salt Lake, the Dead Sea of America.

The Mexicans depended on their supply from the sea-coast, although there are some saline plains in Mexico; and here I wish to point an example showing that simple want of salt itself as a condiment would not produce leprosy. The Tlascalans, enemies of the Mexicans, and surrounded by them, were thus, as Prescott mentions, deprived of salt, so that they did not care to use it, having been so for about half a century; but they had food of all kinds in abundance.

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[1] See "Zambesi," pp. 132, 216, 225, 586, and "Last Journals," vol. i. pp. 34, 98, 106, 176, 212; and vol. ii. 19, 56, 104, 116, 217, 256, 335.

[2] As at *ibid.*, p. 56. One remarkable exception to the, on the whole, sufficient supply of salt in Southern Central Africa, is in the great Barotse Valley, where "a kind of leprosy peculiar to the Barotse Valley" is mentioned. ("Travels in South Africa," pp. 503 and 600.)

[3] Marco Polo (in Kerr), p. 345; and Huc, vol. ii. and Prejavalsky, Mongolia, pp. xxv., 24, 52, 108, 116, and 118; also Humboldt, p. 409.

[4] *Ibid.*, vol. i. p. 70.

[5] Davis, p. 140; and Yunnan, R. K. D., in *Cornhill Magazine*, 1866.

[6] "All Round the World," p. 308.

In South America and Peru there are extensive saline basins, 7000 feet above the sea level; near the Rio Negro in Patagonia, not far from the sea-coast[1] (about forty miles) are large salinas, where the salt is crystallized in cubes; and before horses were introduced into the country, the inhabitants seem all to have lived near the coast so as to obtain salt, as all their tombs are found there.[2] On the upper waters of the Amazon the Indians extracted salt from the ashes of a palm-tree by lixiviation.[3] Thus, apart from the modern use of salt-fish, which is so universal, the natives of South America have always been able to obtain salt.

Thus, in no country in which salt is abundant, or where it is not so, but animal food is plentiful, has leprosy ever originated, while the distinguishing characteristics of the two great centres of origin of the disease, are want of salt, combined with a vegetable diet, and that in very insufficient quantity.

Carrying the inquiry even further, it is worthy of remark, that the millet of all kinds (both the Sorghum and Pannicum), which forms the staple food of Northern Central Africa, and is used to a very great extent in India, as well as the maize and rice, and the pease and barley, which mixed form the "gram"[4] so much used in the latter country, are all deficient in chlorides, so that those using them are not partially supplied even in their food with salt, as is the case with even the poorest diets having other grains, as oats and wheat, as their bases or as adjuvants, these grains containing an appreciable quantity of either sodium or potassium. In the grains used in Africa and India also, the quantity of *soda* and *potash* is comparatively small.[5] Even a poor diet, such as that of the "Scotch Local Prisons, Lowest Diet, 1851,"[6] contains about twelve grains of salt, of which about one-half would be in the one ounce of meat, while a man using one pound of fresh meat daily, with other generous diet, obtains about 100 grains, besides what he uses as a condiment,[7] in which form he would use nearly three times as much,[8] showing a great contrast to the absolute deprivation of it suffered by the people of Africa and India.

As to the necessity for salt to the healthy carrying on of the functions of the animal body there cannot be a doubt, when we consider the intense craving for it, and its visible effects on the condition of animals obtaining a proper supply of it. As every breeder of cattle knows, they at once fall out of condition if fed even on rich pasturage where there is no salt, unless it is freely supplied to them at the farm, when they lick it eagerly. I Australia (where there are large salt lakes) apparently poor pastur ground is preferred to rich, if there is plenty of salt on it. Th same applies to camels, who keep in condition with, but lose fles without, salt.[1]

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[1] Darwin, *op. cit.*, pp. 65 and 78. [2] *Ibid.*, p. 169.

[3] Humboldt, Travels, p. 262. [4] Census of N.W. Provinces, p. lxv.

[5] See Blyth's "Dic. of Hygiene," etc., pp. 68, 310, 494, and Parkes, p. 208.

[6] See Playfair's "Tables of Nutriment in Various Dietaries, 1860," table xi. (For short terms of imprisonment.)

[7] For bases of these calculations see Blyth, p. 362, table and footnote.

[8] In six months' observation in my own family (counting two children of five and six years as one adult), I found that not quite 300 grains were purchased daily for each adult.

I have seen it stated that human flesh is salt-tasted, and this i probably one cause of cannibalism in those deprived of flesh food. Salt has been venerated from the earliest times, and was the chie thing used by the Romans, with bread and cheese.[3] All huma beings, and especially vegetable feeders, have an instinctive cravin for it. The Indians of Brazil ride long distances to obtain it, an their children eat it greedily.[4] Werne,[5] speaking of the Keks, an Baker[6] of the Obbos, attribute their disgusting habit of mixin milk with cow's urine to a desire to retain the salt, of which the cannot get a supply otherwise. In China, the wild hill tribe make raids on the Chinese villages in Yunan on purpose to obtai it.[7] Such examples show that no vegetable-eating tribe will d without salt if it is within their power to obtain it.

Having thus shown that it appears to be a necessary article o food, we will now consider shortly what are the probable consequences of a total deprivation of it. The chief action of salt in the body is, as is well known, to dissolve albumenoids. If the system is deprived of it, would we not expect that the albumenoids kept in solution by it should become deposited? Now, this is exactly what takes place in leprosy, in which, in the tubercular form, there is a deposit of albumenoids under the skin—in the non-tubercular, between the tubules of the affected nerves. All other changes follow from this, which is the primary one.[8]

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[1] Prejavalsky, *lib. cit.*, p. 122.

[2] As, for instance, among the Fijians (Boddam Witham, *lib. cit.*, p. 345, "cannibalism caused by hunger"). He elsewhere mentions, that "for generations the chiefs of the mountains were the hereditary enemies of those lower down" (as in New Zealand); thus, these were deprived of salt, and "the common people were forced to be vegetarians," and droughts caused great distress. Such distress seemed to be only temporary, however, as Williams ("Fiji and the Fijians," 1860, p. 100) states that they had "abundant" food.

[3] Adam's "Roman Antiquities," p. 411.

[4] Darwin, *lib. cit.*, p. 110. He remarks that the Spanish Guachos, who are *flesh-fed*, "and lead the same kind of life," use hardly any salt.

[5] "Expedition to Discover the Sources of the White Nile," 1840, p. 278, etc.

[6] "Albert Nyanza," p. 240.

[7] *Cornhill Magazine*, August 1876, "Yunnan," by R. K. D.

[8] Carter, *Trans. of Med. Soc. of Bombay*, 1861, pp. 60–68.—*Lancet*, 5th April 1873; Report on Leprosy and Elephantiasis, 1874, p. 3; *Trans. of Path. Soc.*, 1877, p. 2. I have already mentioned that Carter speaks of the brown "leprous elements," described by him in 1876 (*Path. Soc. Trans.*), as occurring in other skin diseases. They can hardly, therefore, have the importance in causing neuritis and other symptoms that he seems inclined to ascribe to them. See also Daniellssen and Bœck, *lib. cit.*, pp. 234-260. E. Wilson, *Lancet*, 15th February 1873. Coll. Phys. Rep. lxxiii.

The increase in albumen and fibrine in the blood, described by Daniellssen and Boeck[1] as existing previous to deposits or exudations taking place (the value of the analysis proving which is, however, denied by Kjerulf[2]), is probably due to the deranged state of the liver interfering with the proper excretion of urea.

And as chloride of sodium is, like chloride of ammonium, a liver stimulant, although not perhaps so active as the latter, which is probably the most active liver stimulant we possess,[3] and is, in fact, *the* liver stimulant supplied by nature so abundantly, the entire deprivation of it would tend to produce functional derangement, and with that derangement the feeling of intense langour, which is so marked a symptom in the earlier stages of leprosy, probably caused by retention of albuminoids in the blood. Thus, the deprivation of salt would in another manner assist in producing the primary phenomena of leprosy.

As showing where the disease seems to begin, I may mention that these exudations or infiltrations are first noticed in tuberculated leprosy around the bloodvessels of the corium,[4] where are seen elongated spaces occupied by round, nucleated (sometimes fusiform)[5] cells. In non-tuberculated leprosy these changes take place in the interfibrillar spaces of the nerves. The cell proliferation is looked upon as a neoplastic, not an exudative, formation by Virchow; but the later researches of Carter (1876) do not agree with this, the cells being, according to him, formed, at least primarily, from the exudation round the bloodvessels, and in the line of the lymphatics. Possibly both views may be reconciled, there being firstly exudation, and neoplastic formation of cells in it afterwards by cell division. The brown pigment granules already mentioned Carter looks on as new formations; but they are, as I have already said, found in non-leprous skin diseases.

In thus attempting to show that want of salt may be the primary cause of leprosy, I must not be understood, in the least degree, to indicate that all cases are so caused—what I have already said as to the communicability of the disease precludes this. If the theory I have tried to sketch out is correct, it would only account for primary cases in India and Africa, such cases becoming centres of contagion for others. I may here venture to say, that I do not see that any sufficient proof of the existence of any specific leprous poison has ever been advanced, but that all proofs at present available would rather show that all the diseased tissues of a leper are of themselves poisonous, and contain within themselves the power of causing similar diseased changes in the healthy tissues of others.

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[1] Pp. 234 and 260.

[2] Virchow, Arch., *op. cit.*, p. 508; and Hebra, vol. iv. p. 172.

[3] As was ably pointed out by Murchison, in his classical Lectures on Functional Diseases of the Liver, *Br. Med. Jour.*, vol. i. 1874.

[4] Carter, in *Path. Trans.*, 1876, p. 297.

[5] Virchow, *op. cit.*, p. 514.

Since forming, from my study of the subject, the ideas as to the causation of leprosy I have ventured to express, I observe that Dr Dickenson,[1] from his extensive observations on kidney disease, looks on deficiency in potash as a cause of lardaceous disease, in which, as in leprosy appears to be the case, there is firstly effusion and then growth of nucleated tissue. This has a close analogy to the deficiency of sodium salts, which I am led to believe is a cause of leprosy, though it may be that the want of the chlorine of common salt is of as much importance as that of the sodium.

I have thus endeavoured to put forward my theory of the primary production of leprosy, not, I hope it will be understood, in any spirit of dogmatism, but as one which appears to be best supported by the history of the disease in its early homes,[2] the conditions of life in which alone are of value in attempting to ascertain its true etiology, and by the consideration of the chemical action of the particular article of diet so deficient in those countries in the food of the people, this being taken in connexion with the pathology of the disease. Whatever value the theory may have, researches yet to be made, I hope, by such workers as Vandyke Carter, will show. If it is a correct one, then it is possible that at the present day cases are arising daily in India from the causes pointed out,—cases which might be prevented were a network of railways, roads, and canals spread over the country, putting salt or animal food within the reach of all. Such a time *may* be far distant, but it is one to be sincerely hoped for.

We will next consider the question of the heredity of leprosy.

ARTICLE IX.—*Comments on a Case of Hyperpyrexia.* By THEODORE CASH, M.B., M.R.C.S., Resident Physician, Royal Edinburgh Infirmary.

RARELY as death occurs now-a-days during the course of a rheumatic fever, it is from time to time the physician's misfortune to have to register such an occurrence, and to own himself outwitted by a disease of which he had hitherto almost believed himself master. And it adds no consolation that the fatal case may have passed through a favourable early stage, and that the grave prognosis could only be established a few days—it may have been only a few hours before the death of the patient—for the intercurrent affections which prove disastrous frequently arise without premonition, and culminate in death with great rapidity. Such is the case in pulmonary apoplexy, in rheumatic meningitis, and in some instances manifesting obscure nervous symptoms, but wanting a pathology.

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[1] *Br. Med. Jour.*, 3d June 1876, p. 684.

[2] As another work proving the communicability of a disease by tracing its history, as I have tried to do in regard to leprosy, I may here be allowed to mention the classical history of cholera by Dr C. Macnamara.

There are occasional cases, however, in which we are not surprised by a fatal termination, and can anticipate it some time before its occurrence. A careful study of many cases has convinced observers of eminence that certain thermal elevations furnish us with data on which we are compelled to prognose unfavourably. Thus, should the thermometer show a temperature of 105°, Wünderlich[1] and Fox[2] consider that the case is one of great gravity and that death will probably ensue; but yet slight hope may remain, as, in some instances (one has been recorded in the Bristol Infirmary), this elevation has been attained, and yet recovery has occurred.

It seems as if the thermometer in acute rheumatism separated in an almost occult manner between complications to be immediately feared and those dangerous, at most, in the far future. Thus, we find that rheumatic pericarditis seldom causes marked thermal elevation, perhaps not even the tenth of a degree;[3] and the same may be said of a moderate endocarditis, though, in the latter case, the germs of future valvular disease may have been most surely sown. The most acute articular pain need furnish us with no cause for anxiety should the temperature remain unaffected. Mr Goodhart[4] mentions five cases of delirium occurring in the course of rheumatic fever. Of these, two—one of a temperature of 105°, the other of 109°—were fatal. The other three, in which the temperature never exceeded 103°, recovered. On the other hand, a diaphoresis most copious even to the production of a general sudaminous eruption may occur, with an accession to the temperature that warns us of impending death. But occasionally we find the thermometer an insecure guide. Thus, a sudden elevation of two or three degrees may occur unaccompanied by complaint from the patient or any detectable addition to his symptoms—or the lapse of a few days without evacuation of the bowels may send up the mercury to an astonishing height. In the former case the elevation is very transient, in the latter an aperient will reduce it to its normal. In neither instance will the elevation exceed 103°·5 or 104°.

I have already said that a temperature of 105° occurring during the course of rheumatic fever must usually be regarded as a signal of approaching death. A temperature of 107°·6 in every disease—excepting occasionally in relapsing fever—is said to be fatal.[5] Above 107°, then, except very occasionally, life cannot be sustained; why, in the present state of our knowledge, we cannot exactly say. Weikart alleged that at this temperature fibrin began to be separated from the blood; but this has not been clearly demonstrated, and many doubt this elucidation of the problem. Wünderlich proposes to apply the term *hyperpyretic* to cases reaching or exceeding 107°·5 (Fahr.) Therefore, hyperpyrexia and death become synonymous. Rheumatic meningitis, pulmonary embolism, and what has been termed "acute heart-disease," are three terminations of acute rheumatism, all of which have occasionally been associated with hyperpyrexia. But there is yet another class of rheumatic cases, those termed "nervous," or "nervous rheumatoid," which manifest a degree of hyperpyrexia unattained by any of the others. A case apparently of this nature Dr G. W. Balfour has kindly left me at liberty to transcribe from my notes taken at the time of its occurrence.

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[1] Wünderlich, *Med. Thermometry.*

[2] Dr Long Fox, *Med. Times*, January 1870.

[3] Wünderlich, *Med. Thermometry.*

[4] *Guy's Hospital Reports.*

[5] Wünderlich.

CASE.—J. C., a domestic servant, æt. 21, entered Ward XV. on the 5th of February 1878, suffering from acute rheumatism. She had been confined to bed for fourteen days preceding admission, and during that time, and the first five days of her residence in the Infirmary, manifested no symptoms of an unusual or alarming character. No complications were recognisable beyond the manifestation of spanæmia with slight cardiac dilatation, so frequently present in febrile disorders. There was a sudaminous eruption on the face and chest. Diaphoresis was copious. The temperature varied, from the time of her admission to the evening of the 8th, from 99° to 101°·4; the pulse from 84 to 108. (It will thus be seen that these weighty clinical tests furnished no ground for the arousal of apprehension as to the ultimate termination of the case in a favourable manner. The pulse was decidedly slow, considering the febrile movement, slight though this was in extent; the temperature showed its greatest elevation—101°·4—on the evening of admission, thus contributing to the well-established fact that the first registration after admission to hospital is usually the highest in the course of the disease.) No albuminuria nor diarrhœa were present. The constitutional treatment consisted in the exhibition of 20 to 30 grains of salicine every two or three hours, according to the temporary exigencies of the case.[1] The patient lay in blankets and the affected joints were wrapped in cotton wadding. She was restricted to a milk diet.

On the evening of the 8th J. C. appeared well, and complained less of pain than formerly. The thermometer, however, showed an elevation of temperature to 102°. Through the night patient is said to have been very thirsty. No reference to headache nor unusual heat was made. On the morning of the 9th (the day of her death), at 7.30, the patient is reported to have expressed herself well. She desired to be sponged, and had a drink of milk.

About 9 o'clock patient was found to be unconscious, and apprehension being aroused on her condition remaining unaltered,

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[1] It may have come about that the continued use of salicine, by subduing what might otherwise have been to us an alarming temperature, robbed us of means of prognosing the case aright.

I was at 9.30 summoned to the Ward, and found the patient could not be roused, but gave slight evidence of sensibility to pain when the joints were moved. The breathing was 24 per minute, regular and free from stertor. Diaphoresis very abundant. The temperature in the axilla was 107°. Pulse 134, regular but weak. The pupils were equal and much contracted. The physical examination revealed no pericarditis nor other inflammatory affection.

In less than an hour (10.15) the insensibility had become complete. Respirations stertorous, 24 per minute. Temperature 110°·8. (The heat of the body intense to the touch.) Pulse 134, weaker than at last observation.

11.30.—Patient sinking rapidly. Coma profound. Temperature 111°. Pupils dilating.

Death resulted in less than an hour. One hour after death the thermometer in the axilla still attained an elevation of 111°.

Large doses of digitalis were ordered as soon as the condition of the patient was seen, and ice to be applied to the head. Subsequently Dr Balfour directed the packing of both head and chest with ice bags, but without any hope of success, from the extremely rapid rise of temperature and deep insensibility immediately following.

It will be seen that on the evening of the 8th a temperature of 102° was registered; but though this was the highest temperature that had occurred in the case, and was in itself a remarkable fact, supervening, as it did, after five days' persistent treatment with full doses of salicine, it yet excited no alarm, partly because such a temperature is not unusual in acute rheumatism, and partly because it was unaccompanied by any exacerbation of the phenomena present by any complication of recent origin, or by anything unusual or abnormal in the case generally.

The post-mortem examination was made by Dr Hamilton on the 10th February. I shall put down only the important points.

External Appearances.—Post-mortem rigidity ill marked in upper, more in the lower, extremity. Pupils widely dilated. Joints normal. Both body and viscera quite cold.

Heart.—A number of ecchymoses are to be found on the anterior and posterior aspects of the organ. No appearance of inflammatory exudation on surface. Slight nodular thickening of both cusps of the mitral, apparently from commencing endocarditis; the nodules when cut into are gelatinous in the centre.

Lungs.—Substance of both very deeply congested. Small hæmorrhages of lower lobes. Right lung adherent by semi-organized fibrous bands.

Kidneys.—Both much congested. (Microscopically the epithelium of tubules was found to be granular and cloudy.)

Calvarium.—Thick and dense. Vessels of dura mater almost empty, peculiarly hard and cord-like. Surface of brain congested, especially on right side. Pons anæmic, otherwise apparently normal. Substance of brain not congested.

The other organs showed no important changes beyond more or less marked congestion.

We see, then, from a study of these notes, that the sectio revealed no lesion which could even suggest to us a cause for the sudden hyperpyretic termination to the patient's life. That the hyperpyrexia was of itself enough to destroy life is, I think, proved by the careful thermometric observations of Wünderlich, Fox, and others, already alluded to. But what is the cause of hyperpyrexia? Is it primarily due to a nervous or a blood lesion? Is it due to some functional central derangement which would prove but transient in its effects—as perhaps in the sudden and unaccountable elevation of temperature frequently occurring in the lysis from acute rheumatism—did it not, by producing a thermal condition incompatible with human life, at once destroy the patient?

Wünderlich, in writing of cases of the nature of that under consideration, says:—"In the cases which end fatally without multiple centres of suppuration, and without jaundice, the disease at first runs its course like a very severe articular rheumatism. A descending direction may even have set in as regards the temperature, but suspicious nervous symptoms show themselves simultaneously. These suddenly arise with very rapid fresh increase of temperature, and in the briefest time reach most extreme degrees, so that death occurs with hyperpyretic temperatures, whilst no anatomical lesion in the brain can be discovered in the corpse, or only very moderate degrees of meningitis."

I have ventured to put this case of J. C. on record, not because I can in any way account for its phenomena, but under the belief that it will be by the careful study of the clinical and post-mortem details of many such cases that we shall obtain the truest light to guide us in determining what is the nature and essence of hyperpyrexia.

ARTICLE X.—*Practical Observations on some of the more Common Diseases of Early Life.* By CHARLES BELL, M.D., Fellow of the Royal College of Physicians, Edinburgh, etc.

(*Continued from page* 643 *of* vol. xxiii.)

SQUINTING.

THIS deformity may affect one or both eyes; and although it is generally congenital, it is occasionally the result of placing the crib negligently with its side to the light, or by having any attractive object so placed that the young infant gets into a habit of looking at it sideways. It may result from cerebral or intestinal irritation, and it is in consequence a frequent accompaniment of

hydrocephalus. A mark on the side of the nose has been the cause of it, by inducing the child to look habitually towards its nose. In short, whatever leads to the one set of oblique muscles to act more powerfully than the others may produce it.

Treatment.—According to Dr Davis,[1] a cure may be effected by very simple means, viz., by applying a piece of sticking-plaster spread on bright-coloured silk, and placing it in such a position as to attract the eyes to the opposite side to which they are naturally inclined. By this means the preternatural contraction of the oblique muscles may be overcome. In regard to the position of the crib in which the child sleeps, it ought not to be placed with its side to the light. It has been proposed, when all other means fail, that the contracted oblique muscle should be cut across, but the results have not been permanently successful.[2]

CYSTS IN THE NECK.

Although these tumours are of rare occurrence, they must not be altogether overlooked, as when they are met with they are liable to grow rapidly, and become the source of great annoyance by pressing on the neighbouring parts. They are in general unattended with pain, and demand attention entirely from their size. They may appear singly, or there may be several occurring at the same time, and sometimes uniting together. They contain a clear viscid fluid. They are supposed to be the consequence of the mother having got a fright during pregnancy.

Treatment.—It is usual either to pass a seton through them or to excise them.[3]

EXCESS OF EXTREMITIES.

This is not an uncommon deformity, more especially in regard to the fingers and toes, which are liable to exceed the usual number. The supplementary extremities are always situated either on the outer or inner border of the hands or feet; and they are smaller than the other extremities. They are entirely useless appendages, and as they possess no muscles, they are not movable. They are therefore an incumbrance, and ought to be excised as soon as possible; but in doing so, great care must be taken not to injure the joints of the natural fingers or toes. This is occasionally very difficult, as the preternatural extremities have been found to communicate with them.

This kind of deformity is often hereditary, and in some families several members have additional extremities.[4] In one family I attended, the youngest child had six fingers on each hand, and the little toe of the right foot was webbed. Several of the other children had this peculiarity, but this was the only one who had supernumerary fingers. The father was born with six toes on each foot, and all his brothers except one had either additional fingers or toes. It is considered a sign of good-luck, and this opinion was fully verified in the family referred to, as they were all prosperous in life.

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[1] *Vide* his edition of Underwood, p. 591.

[2] Sir Charles Bell's Practical Essays.

[3] Foster, *op. cit.*, pp. 103-4.

[4] Mrs M'Guire, a Maternity patient, was delivered of her thirteenth child, a girl, on the 4th February 1869, after an easy labour, which was so rapid that the child was born some time before the medical attendant arrived; but when he came, he found the placenta still retained. On examining the cord he found that there was a firm knot about the middle of its length, which he untied.

In regard to the child I have mentioned, Mr Syme removed the supernumerary finger very early with ultimate success, although the operation was followed by erysipelas in one of her hands.

DEFICIENCY OF EXTREMITIES.

This peculiarity may occur to any of the extremities, but it is extremely rare. It is in general the result of spontaneous amputation in utero. There is a case reported in the *Medical Times and Gazette*, of the 10th December 1853, in which both arms and both legs had been removed by this process, leaving nothing but four short stumps. In other respects the child was well formed. It is remarkable that none of the amputated limbs were found, a circumstance which led to the supposition that they had been dissolved in the liquor amnii.

In general, when the process of amputation takes place when pregnancy is far advanced, the parts separated are expelled at the time of parturition. The cause of this remarkable process is supposed to be the constriction of the limbs by means of bands of false membrane, or by twisting of funis.[1] But the investigation into the causes of these deformities is more curious than useful, as they cannot be ascertained to exist until after the birth of the child, and cannot be prevented. The subject has been fully discussed by Dr Montgomery.[2]

She was not at her full time, having altered on the 10th May, and the child gave unquestionable signs of being premature, as its upper extremities were only three and a half inches in length, the arm being one and a half inch, and the forearm two inches—a circumstance which indicates that the child was little beyond the seventh month or commencement of the eighth month. The child had six fingers on each hand, all of which had nails. There were talipes varus of both feet, and the anus was occluded. There were several marks on the head, as if the result of blows. The patient stated that five of her children were born in the eighth month, and died soon after birth. One of these had twelve fingers and twelve toes—a peculiarity which seemed to be hereditary, as both father and grandfather had had the same. She accounted for the appearances on the child's head by her having been knocked down and kicked on the abdomen by a drunk man on the 1st January. The child took some food and its bowels were moved, but the evacuation passed through the vagina. It died the following day at 9 A.M.

[1] Tanner, *op. cit.*, p. 135.

[2] Montgomery on the Signs of Pregnancy.

WEB FINGERS.

This deformity varies in degree, but it is seldom of such extent as to require surgical interference.

CONTRACTION OF THE FINGERS.

Contractions are less common in the upper than the lower extremities; but when contraction occurs in the hand, it is generally the little finger that is most affected. As the child advances in years the contraction may be overcome.

Treatment.—Unless the usefulness of the hand is seriously impeded, it is unnecessary to do more than gently to endeavour to extend the finger from time to time; but if the contraction be very troublesome, an operation similar to that which has been recommended in talipes may be performed. This should not be done in early life.

HERMAPHRODISM.

There have been various kinds of malformations thus designated described by authors; but, for the most part, they are mere examples of arrested development, as there is no instance on record of a perfect hermaphrodite in the human species. Sir James Simpson[1] has given an interesting and detailed account of these deformities; but the subject is important merely in a pathological point of view, as a cure is seldom if ever effected.

VAGITUS UTERINUS.

Although the crying of the fœtus *in utero* cannot be considered a disease, it is an event which has been proved to have taken place by many foreign authors, as well as by Dr Evory Kennedy, and it is of great importance in a forensic point of view; because a child may cry and fully dilate its lungs *in utero*, yet be still-born—a circumstance which might lead to most injurious suspicions in regard to the cause of death; for the hydrostatic test would go far to prove that the lungs had been naturally inflated, and that the child had in all probability been born alive and destroyed after birth.

PART II.

Before entering on the consideration of the diseases of early extra-uterine life, which forms the second part of these observations, it is necessary that we should investigate into what is the proper management of children in a state of health, along with their peculiarities and habits, the neglect or ignorance of which is a very common cause of disease. In following this course our attention is naturally directed, in the first place, to the requirements of the new-born infant, in order to render it comfortable and agreeable to those who have the charge of it.

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[1] *The Edinburgh Medical and Surgical Journal.* This was the celebrated baronet's first published paper.

CLEANLINESS.

Experience and observation have proved that freeing the infant from all impurities soon after birth, and keeping it clean afterwards, is most conducive to its health and comfort. Therefore, the first washing of the child is an operation of much importance, yet it is one which is too often carelessly and imperfectly performed. Not only should the first washing be thoroughly done, but great care should be taken in drying the child; otherwise, from the exceedingly delicate nature of the skin, it is liable to be abraded, giving rise to erysipelas, one of the most serious ailments that can occur in infancy.

As in general the new-born child is more or less covered with the butyraceous matter, called vernica caseosa, which sometimes adheres so firmly to the skin that it requires considerable care in removing it; but this will be most easily and effectually done by anointing the child with lard or oil before wetting it, and then use brown soap and tepid water. The head and face of the child should be washed first, then it should be put into the bath in order that the lower parts may be thoroughly cleaned. It should then be carefully dried by means of a soft towel, which should be used in the manner of a sponge rather than by rubbing, so as to avoid irritating the skin. The utmost care should be taken in drying the axilla and the groin, so as to prevent excoriation. This will be best done by taking a corner of the towel, and after gently pressing the parts with it, wave it like a fan, at the same time breathing or blowing on the part to be dried.

It is more particularly necessary that the first washing should be carefully and thoroughly done, as the child should not be put into a bath again until the navel has separated, which is most frequently about the fifth or sixth day after birth; therefore, if the child is imperfectly cleansed at first, it is rendered very uncomfortable in itself, and unpleasant to those who have the charge of it. After the separation of the cord the child should be put in a bath regularly twice a day, in order to cleanse it and promote the secretion of the skin. It is important to remember that it should never be put into its bath with a full stomach, as it is liable to bring on convulsions.

CLOTHING.

The new-born infant, like other young animals, is extremely sensitive to the changes of temperature; but while they are wisely provided by nature with a warm, woolly, or downy coat to protect them from the cold, the infant comes into the world naked and entirely unprovided with any covering to shield it from the effects of the weather. It is therefore left to the judgment and experience of the mother or nurse to adopt such clothing as its circumstances or situation may render suitable.

While the infant is naturally sensitive to the changes of temperature, its power of generating heat is comparatively much less in proportion than at a more advanced period of life. From the ignorance or neglect of this circumstance, many children fall a sacrifice to the effects of cold. This is strikingly illustrated in France and other Roman-Catholic countries, where it is the custom to take infants soon after birth to the Mayor of the Commune to be registered, and this is done sometimes in the depth of winter;[1] the consequence is that the mortality varies according to the severity of the season, and the distance the children are carried.

In reference to this important subject, Dr John Clarke has remarked "that it must be obvious to every practitioner of experience, that those children who are least exposed to cold are the healthiest, whilst those who are exposed to the changes of temperature, with insufficient clothing, are never free from some ailment, and the diseases which might, under other management, have remained dormant for ever, are stimulated into activity, hence many children become victims to scrofula and phthisis." Yet there are some people so prejudiced as to follow the cruel and pernicious custom of exposing their children to the weather imperfectly clothed, with the view of making them hardy; and they support the practice by referring to the robust appearance of the children of the poor; but they do not seem to be aware that few of those unfortunate creatures attain the age of puberty. This melancholy fact is fully corroborated by Adam Smith, who states that it is not uncommon in the Highlands to find, that out of a family of twenty, not more than two reach the age of puberty.[2]

The clothing of infants should be subservient to the convenience and comfort of the wearer, being sufficient to afford moderate heat, and so fashioned as neither to be oppressive by its weight, nor so tight as to produce a feeling of constraint.

FOOD.

Although, in general, nature provides in the female breast the most suitable food for the infant in early life, it is too often deprived of this desirable kind of nourishment by the mistaken notions of refinement and self-indulgence on the part of the mother, and by the unprincipled conduct of the ladies' nurse, who sometimes takes means to prevent the secretion of the milk, under the impression that if the lady does not suckle her baby, she will the sooner require her services again.

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[1] Dr Edwards and Dr Villance.

[2] *Wealth of Nations*, vol. i. p. 105.

Even when no such impediments to the mother's suckling her child exists, it is necessary, in consequence of the milk not being usually secreted in sufficient quantity to satisfy its wants for eight-and-forty hours, to provide some simple kind of food as a substitute. Much difference of opinion has been entertained as to what this should consist of. In former times the new-born child was fed on butter and sugar—a custom which seems to have arisen from the text in reference to our Saviour, which says, "Butter and honey shall he eat, that he may know to refuse the evil, and choose the good."[1] But this custom has long ceased in this country, and in place of it the new-born child usually gets sugar and water until the mother can supply sufficient nourishment.

If the child is to be reared entirely artificially, it should be fed on a mixture consisting of three parts of milk, one of water, along with a little sugar, which should be administered by means of a nursing-bottle, which is a great improvement on the old custom of feeding with a spoon—a practice that proved fatal, according to Merriman, to seven out of every eight children so nourished in London.

The apparent cause of this great mortality was the overloading the stomach with unsuitable food, such as rusks, etc., which produced fatal inflammation. Although there is much less risk when the bottle is used, still great attention is necessary in rearing a child by means of it, by its being fed too often, or by its being allowed to suck after it has gone to sleep—a circumstance which an infant is extremely apt to do—when it overloads the stomach either with the mixture, or, if the bottle gets empty, with air, when it frequently wakens screaming from the painful feeling of over-distention, and nothing will pacify it until it either vomits or brings up the flatulency.

This is an occurrence which may take place in infants suckled at the breast, and the mother becomes alarmed by the violent screaming of the child and by its refusing to take breast, and she very naturally sends for the doctor, who, if inexperienced, may increase the sufferings of the child by dosing it with medicine, when in the generality of cases all that is required is to expose it before the fire and use friction on the abdomen.

In order to avoid the serious result of overloading the child's stomach, it ought not to be fed oftener than once in the two hours, and the mixture should be made fresh every time it is used, and, if possible, the milk should be procured from one cow. When the bottle is not in use, it should be washed clean and allowed to remain without the cork, so as to keep it perfectly free from smell, and avoid the chances of the milk acquiring a bad taste when put into it.

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[1] Isaiah, chap. vii. verse 15.

Considerable difference prevails in different countries in regard to the period when the infant should get artificial food in addition to the mother's milk, or, in other words, when it should be taught the use of the spoon and accustomed to comparatively solid food. In Holland, Italy, and in Turkey, the infant is entirely supported by the mother's milk for twelve months. Some of the American Indians continue to suckle their children until they are seven years of age. In this country, under the erroneous impression that pregnancy is less likely to occur when nursing, the lower classes often suckle their children until they are two or three years old. Some years ago I went into the cottage of a fly-dresser, when a very miserable, cadaverous-looking boy of three years of age came running in to his mother, who was sitting by the fire, and said he wanted drink. She undid her dress and he stood by her sucking her breast until he was satisfied, when he went out to resume his game at marbles. The mother was a mere scarecrow in appearance, and her ribs were almost cutting the skin, while her breasts hung down like partially inflated bags. The period when a change in the character of the infant's food should be made is in general indicated by the appearance of the incisor teeth, which, however, is determined very much by the constitution, health, and locality of the child. If it is strong, of robust constitution, and more especially if it is in the country, the teeth will in general begin to make their appearance about the fourth month; but even should this not be the case, the child may at that time be gradually accustomed to spoon food, more especially if the mother has only scanty supply of milk, or if she feels nursing begins to tell on her constitution. The sort of spoon-meat which is most suitable for an infant at that period of life should consist of stale bread soaked in water, and after the water is strained off, a little new milk and sugar should be poured over it, and then it should be carefully bruised down before the child is fed with it. This is infinitely better than the more fashionable food composed of rusks, which is the most indigestible food an infant can take; at the same time it contains little or no nourishment. It is in consequence the cause of serious irritation and diarrhœa. Next to the bread-saps, as it is called by the nurses, the best food for the infant is thin well-boiled porridge and milk. It ought to be made by putting the meal into cold water, then straining off the liquid and boiling it down to a pulp. This is not only very nourishing but easily digested, and the child soon becomes very fond of it.

(To be continued.)

ARTICLE XI.—*On the Treatment of Spasmodic Asthma.* By J. P. BRAMWELL, M.D. and L.R.C.S., and one of the Visiting Medical Officers of the Perth Infirmary.

SPASMODIC asthma is occasionally met with as an effect of amenorrhœa taking the place of the natural flow. At other times it is to be found as a painful complication in chronic forms of Bright's disease of the kidneys, and also in some cases of acute capillary bronchitis it crops up as a very dangerous complication by producing still further respirative embarrassment. As a rule, however, it is an idiopathic affection of a neurosal character, depending upon hereditary inherent weakness in some of the nerve centres, and closely allied to other diseases of the same group. Thus, I have seen a mother who suffered from this malady some of whose children were asthmatics, while others stammered and stuttered in a very painful manner. The inco-ordination was there, but the organ attacked was not in all cases similar. This transformation in neurosal affections is a most noteworthy phenomenon, and the key to their rational treatment. (See Lieving on *Megrim.*) I have observed an epileptic patient produce a child who suffered first from night terrors and then from megrim, but who never became epileptic. The whole group, indeed, are convertible maladies, and closely affiliated, the difference being specific, not generic. If further proof of this were wanting, it will be found in the fact that the remedies which act most potently on such affections are all anti-neurosal, and what is good for one will in general be found good for all. Besides, the conditions which tend to check the one tend to check all. A severe illness will often give a long immunity from these nervous disorders, so will pregnancy, and so also will change of climate. A few months ago I delivered a person of her first child who was subject to megrim. All the time of her pregnancy she was perfectly well, but two days after the child was born she had a return of her old malady. There seems at first sight no relation between an asthma and a megrim, but let iodide of potassium be freely administered and both will yield, if not permanently, at least temporarily, to this valuable remedy. The same may be said in a less degree of sulphate of atropia and chloral hydrate, all which agents have a controlling power on the two diseases mentioned. I am not in a position to determine whether bromide of potassium will arrest a paroxysm of asthma, but there can be little doubt that iodide of potassium will act beneficially on epileptics. Brown Séquard's prescription is a combination of the bromide, iodide, and bicarbonate of potassium. These facts, we think, establish a relation not only between the megrim and the asthma, but also between the asthma and the epilepsy.

Spasmodic asthma in its simplest form rarely leads on to serious mischief. If, however, the fits are frequent and prolonged, organic, pulmonary, and cardiac changes may ensue; hence it is of much importance to shorten, if possible, the duration of the attacks. For treating the paroxysm, the best remedies we consider to be iodide of potassium, morphia, chloral hydrate, and sulphate of atropia. In using those substances, however, it will be found that some patients are much more amenable to one, some to another, and that what will bring speedy relief in one is of but little avail in another. Due weight must be given to these individual idiosyncrasies, else relief will not follow. When this has been discovered, the course is easy. When called to some of my asthmatic cases, I know that the remedy for them is the iodide of potassium, for others it is the hypodermic injection of morphia only that will subdue the paroxysm. In using those substances, however, one must proceed boldly, remembering that acute neurosal affections are not stayed by a timid hand. This is an important fact, the recognition of which has gained a well-deserved celebrity for certain quack medicines, *e.g.*, bromide of potassium, in continued increasing doses, sold under the name of the "blue mixture," and mentioned by Niemeyer as curing epilepsy where medical men had quite failed. I am also aware that another quack mixture has gained considerable celebrity in certain quarters of Perthshire for its efficacy in relieving asthmatic affections, the principal ingredient of which is iodide of potassium.

As a general rule, iodide of potassium will be found our most reliable remedy for spasmodic asthma, but in order to cut short the paroxysm and afford prompt relief, it must be given in full doses, such as ten grains, every four hours. A rapid amelioration generally ensues, the tight thoracic gripe soon relaxes, the patient lowers his head, and the remedy may now be given at much longer intervals. With such doses iodism is sometimes produced, but we are not deterred by this from going on till the asthmatic paroxysm succumbs. To show the advantage of this plan of treatment, I may mention that some years ago I had utterly failed to relieve an old asthmatic by small doses of the iodide. This patient for a time was much benefited by chloral hydrate, but the remedy had ceased to produce its former good effects, and had been used so long that toxic symptoms supervened. Over twenty years everything had been tried; chloroform, morphia, belladonna, stramonium, arsenic, etc., etc.—all had now failed. No sooner, however, did I administer the iodide in the quantity specified than the asthma promptly yielded. Is it not the case that the necessity of our time is as much to know how to handle old remedies as to discover new ones? How often is an inveterate case of asthma or epilepsy, if not cured, at least promptly counteracted, not by the employment of another remedy, but by an increased dose of the old—iodide or bromide of potassium respectively. As has been already mentioned, some cases of asthma will not succumb to the iodide of potassium. When this fails, morphia will be found most efficacious. In order to do this, however, we must develop its action as rapidly as possible, using it hypodermically in twenty-drop doses of the solution of the muriate every eight hours. The relief afforded is most satisfactory, and rarely are more than two such doses required. When I contrast the condition of such cases under these remedies with what I have seen twenty years ago, I cannot fail to recognise that, at least in this department, therapeutics cannot be accused of having made but little progress.

Chloral hydrate in twenty-grain doses every eight hours is a good remedy, and suits particularly well in some cases. It is open, however, to the objection of being abused and taken on trivial occasions, to the detriment of the general health. Patients using it must be looked after. The preparations of belladonna are in favour with the French—Trousseau, See, and others. They are, however, very uncertain in their action, and their toxic effects are often developed before their therapeutic; the dry mouth and confused vision are also very troublesome.

At the commencement of an asthmatic paroxysm, a good dose of whisky and hot water, or a cup of very strong black coffee, are good old remedies. The late Sir J. Y. Simpson relied in this disorder on the inhalation of carbonic acid gas, the *rationale* being, I presume, to surcharge the arterial blood with carbonic acid, thus reducing it in some measure akin to the condition of venous blood —the spasm then relaxes. It is in this way, indeed, that all fits of asthma left to nature wear themselves out.

As a prophylaxis, there is nothing better than an entire change of locality. I sent a young man to South Australia whose life was rendered miserable by frequent attacks of asthma, the result being a complete immunity from his old disorder.

Arsenic is also a valuable preventive, but in order to be efficacious it must be given over a lengthened period. A lady patient suffering from psoriasis of the face plied the arsenic most freely, with the double benefit of not only curing her skin eruption, but also of relieving her asthmatic tendency.

Just as in megrim, so in asthma, iodide of potassium is an excellent prophylactic. It may be given in five-grain doses twice a day along with any bitter infusion, or ten grains may be taken at bed-time. By this method the paroxysms may be warded off. Asthmatics also often suffer from *quasi* attacks, which assume the form of coughing, sneezing, stuffing in the head, and chest-tightness. Here also the iodide comes in to soothe and allay those troublesome symptoms which are not catarrhal, although often treated as such; but being neurosal, yield to the iodide promptly, and which, if not treated in this manner, do often pass into regular asthmatic paroxysms.

ARTICLE XII.—*The Sewage Question.* Number V. By ANDREW FERGUS, M.D., Glasgow.

(Continued from page 48.)

IN the present article we shall turn our attention to the various means which have been proposed to mitigate the nuisance arising from sewage. The offensive smell from many polluted rivers was so great that an outcry arose as to whether they were not also injurious to health. I shall inquire into the correctness of this apprehension in a subsequent article. To meet the emergency a crowd of sanitary schemes were propounded for the better disposal of sewage, their originators being so confident of success as to secure by patent their own rights and privileges. By many of these schemes the public at large were deluded and dazzled by the promise of a large pecuniary return, and hundreds of patents, as I have remarked, were taken out for the treatment and purification of sewage. It is sad to read over the list of these and find how many of the inventors show themselves to be utterly ignorant of the nature of the matter with which they had to deal. If ever any one follows out Mr Caxton's idea, and writes a history of human folly, the various plans that have been proposed for the treatment and utilization of sewage will give him a large chapter. No one would imagine how many these are unless by reading over the list of them. I may mention that the list of patents more or less connected with sewage and manures from 1856 to 1875 occupies about ten pages of the "Sewage Disposal Report" presented to the President of the Local Government board (1876), and the cry is still they come. I have already remarked that engineers knew nothing as to the results of water-carriage. They imagined that their duties began and ended with the conveyance of refuse matter into the nearest water-course, and never took into consideration the possibility of any evil as being likely to arise from so doing. They ridiculed, and very properly condemned, the old square drains, little thinking, however, that when their own works came to be tested by experience they also would be found incomplete, because, instead of removing or destroying a nuisance, they had merely shunted it. No doubt the nuisance, so far as visible, was removed from the towns, but thereby the streams and rivers were in many cases converted into elongated sewers, and even the houses which were supposed to have benefited by the change were subjected to the danger of an eruption of sewer gas. Instead of investigating the whole question patiently, the attempts at improvement were always in one direction—deeper and larger drains were made, and gigantic works erected, with, of course, a considerable increase of expenditure, yet after all that the most skilful engineers have done by such works, we every now and again find the system of water-carriage break down. Nothing can be more ingenious and skilful than the present London main drainage scheme, yet in the heavy rainfall of April it utterly failed to carry off the water, and large districts of the city were flooded. Another breakdown occurred in June. In the *Standard* of 3d July there is an account of an application from Lewisham to the Metropolitan Board of Works for relief, where it is stated that after the heavy rain there were two or three feet of sewage in the basement. To the same purpose I shall now quote from the *Medical Times and Gazette* of 13th July, page 53:—"At the meeting of the Metropolitan Board of Works held last week, a deputation from Limehouse Board was introduced to present a memorial on the subject of floodings in certain parts of the district. It was shown that the periodical floodings were the source of disease and pestilence to the whole neighbourhood, and caused serious visitations in what were considered the most healthy parts of the district; when the sewers became overcharged, sewage of the most offensive description made its way into the dwellings. On the motion of Mr Nathan, the memorial was referred to the Works and General Purposes Committee. A deputation was subsequently introduced from St Pancras to present a memorial of a like nature, and this was also referred to the Works Committee for consideration."

Thus, from Lewisham on the south, Limehouse in the east, and St Pancras on the north-west of the metropolis, we have the same outcry, and yet (Krepp on the "Sewage Question") upwards of thirty millions of money have, first and last, been expended on water-carriage in London, and the last addition, viz., the main drainage system, is a wonderful example of the skill and ingenuity of the engineer. No blame can attach to the engineering, which is really magnificent, but the whole system is at fault.

If anything will convince those who still believe that sewage can be taken from towns to land in the neighbourhood in a fresh state, the quotation from the *Medical Times and Gazette* should effectually do so. The reasons why it cannot be so taken are not far to seek. I have shown that excreta is already in a state of decomposition before it leaves a dwelling, or, to speak more correctly, before it passes from the trap between the house drains and the sewer. Another proof that ordinary sewage is in a state of decomposition will be found in the fact that it is hotter, especially in winter, than the external air. No doubt a small part of this heat is from hot water discharged into the sewers; but as this can only be occasional, and as the temperature of the sewers is higher than the external air in winter, spring, and autumn, a considerable portion of the heat must be derived from decomposition. Again, the composition of the air in sewers is another proof of the decomposition going on in them.

As proof of the increased heat of sewers in winter, spring, and autumn, I give the following quotation from Mr Bailey Denton's admirable work on *Sanitary Engineering*, p. 297, etc.:—

"*The Temperature of Sewage.*—It will not require further remark to render manifest that I regard land as the only *certain* medium of freeing sewage of its foul and noxious matters; and, before explaining the manner in which land can be rendered capable of performing this duty, it should be stated, in anticipation of the objection often raised, that frost acts as a bar to the distribution of sewage on the surface of land in the winter season, that Mr William Haywood, the engineer to the City of London, having carefully ascertained the temperature of the internal air of sewers, and compared it with that of the external air for a whole year, found the mean winter temperature of the former to be 11°·61 higher than the latter, while it was 3°·07 higher in autumn, and 0°·06 in spring, In summer the sewer air was 3°·12 colder than the outer air."

"The following table gives the comparative figures:—

TIME OF YEAR.	Temp. in External Atmosphere in Shade.			Temperature in Sewer.		
	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.
	°	°	°	°	°	°
Summer, ...	72	55	65·04	68	56	61·92
Winter, ...	34	30	32·37	52	40	43·98
Spring, ...	61	46	52·46	59	48	52·52
Autumn, ...	68	48	59·90	70	53	62·97
Average of whole year,	...	...	50·24	...	...	55·25

"The Sewage Committee of the British Association ascertained at Merthyr that on the coldest day during the time the observations were made, the difference between the temperature of the sewage delivered to the filtration areas, and that of the air, was 8 deg., while the temperature of the effluent water discharged from the under-drains was found to be one degree higher than the sewage itself. The observations to which I refer were made for eight days in January and in July 1872. They were recorded as follows:—

Date.	TEMPERATURE.				Date.	TEMPERATURE.			
	At Noon.		Average during Day.			At Noon.		Average during Day.	
	Air.	Ground.	Sewage.	Effluent Water.		Air.	Ground.	Sewage.	Effluent Water.
1872.	° F.	° F.	° F.	° F.	1872.	° F.	° F.	° F.	° F.
Jan. 9	...	...	49	46	July 2	70	63	60	56
" 10	50	49	49	46	" 3	70	64	60	55
" 11	49	48	50	47	" 4	75	73	60	55
" 12	48	46	48½	45	" 5	69	70	60	56
" 13	49	47	47	45½	" 6	68	70	55	68
" 14	50	49	48	46	" 7	68	64	60	55
" 15	40	38	43	45½	" 8	68	44	60	55
" 16	37	39	45	46	" 9	68	50	60	55

"The figures in these two tables will probably satisfy you that the distribution of sewage on land is not likely to be much impeded by frost, and that when collected in furrows, as is the case in intermittent downward filtration, the sewage will thaw the frozen condition of land with which it may be brought in contact. I point this out because the Rivers Pollution Commissioners, in their examination of the effluent water from the Croydon Sewage Farm, on the surface of which the sewage is spread by *wide irrigation*, found that during frost in winter it was slightly less pure than at other times, from which it would be inferred that the frozen condition of the soil, at a time when the assimilative functions of vegetation were dormant, was the cause of the inferior character of the effluent. This would in itself suggest that it would be better to have in readiness an area of furrowed filtration ground to receive the sewage during the frost, whereby the greater depth of sewage would ensure a higher degree of temperature."

The lesson Mr Bailey Denton learns from the above tables is, that in winter the greater heat of the sewage will overcome any frost that may be in the ground, and I wish to point out another deduction that may fairly be drawn from them, viz., that there must be decomposition going on in the sewage in the sewers. The question of decomposition is of great importance in regard to the propagation of disease, as we shall see when we come to consider the sanitary aspect of this question; and I may therefore be excused if, while the table is before the reader, I try to prove this point. In the first table it is seen that the summer temperature is 3°·12 colder than the external air. In autumn it is 3·07°, in winter 11°·61, in spring 0°·06 higher in the sewers than in the external air. The average over the whole year is 5°·11 in favour of the sewer air. Of course a little of this heat may be derived from hot water passing into the sewers; but this must have but little effect, as the hot water leaving the dwelling-houses gets cool by passing through the cold house drains and traps on its way to the sewers. Any heat that could reach the sewers in this way would be more than counterbalanced by the rain water and melted snow which enters them so freely. The power of generating heat must be very great indeed, when it can keep the mean temperature of the sewers 5°·11 higher than the external air. It may be argued that I overlook the fact of the increase of temperature as we descend into the earth, but this will not account for the variations brought out in the tables; if this were the factor, the temperature of the sewers would be much more uniform. The thermometers placed at a depth of 30 yards in the wells of the Paris Observatory invariably stand at 53° Fahr. Other observations show, that on an average there is a rise of 1° Fahr. for every 61·2 feet of descent. The winter experiments at Merthyr confirm the view that the increased heat of sewage must to a considerable extent be the result of decomposition. The sewer is hotter than the air or earth. On the coldest day there was a difference of 8° between the sewage and the air. On that day the effluent water was 1° higher than the sewage, and as the air was 37°, the earth 39°, and the sewage 45°, I cannot see how, except from chemical action, *i.e.*, decomposition, the effluent should be 1° higher, viz., 46°. These tables have also a bearing on the subject of sewer ventilation. I have already shown that ventilation, using the term in its strict scientific sense, scarcely exists in sewers, and that the so-called ventilation is mere diffusion and dilution. If there was ventilation through sewers, *i.e.*, the continuous removal of foul air by fresh, there could not possibly be the great difference of temperature which we find in these tables. If this process went on at all times, it would be quite impossible that we should have in winter a mean higher temperature of 11°·61.

Any one affirming that the sewers are ventilated is met by this great difficulty, viz., that if in a state of free ventilation the air in sewers in winter is 11°·61 higher than the external air, how great must be the power that generates this heat; and if, as is most probable, this extra heat is from decomposition, it shows how active and continuous this must be to keep up such a constant supply of heat.

It is also possible that sewage, already in a state of decomposition, acts as a kind of ferment, and expedites that process in freshly added sewage. A little reflection, and a slight knowledge of the subject will, I think, prove to any unprejudiced mind that sewage is not carried from towns in a fresh state: if it were so, there could be no sewer gas, fresh sewage giving none off, and consequently there would in that way be no need of sewer ventilation. And here, let me ask, will any one who believes in the removal of sewage in a fresh state execute works to carry it away without at the same time making provision for the escape of gas?

The discharge of town sewage into our rivers causes them, in a few years, to become offensive, as was strikingly illustrated by the condition of the Thames, and an important question arose as to the best method of purifying water so polluted. The different methods proposed may be classed under the following heads:—1*st*, Irrigation; 2*d*, Downward intermittent filtration; 3*d*, Filtration downwards and upwards; 4*th*, Subsidence; and 5*th*, Chemical precipitation. As the popular mind is most easily impressed with immediate and visible results, irrigation has taken a firm hold on many people; and this is not to be wondered at, when we see the great productiveness of sewage-irrigated lands. It is the application to the earth of the sewage, either "raw" just as it flows from a town, or after subsidence and straining, the solid materials being kept back. It is much more favourable to the process, when from the contour of the land it can be applied by gravitation. Pumping increases the expense, and is possibly more dangerous to health. It has generally been held, that gravelly or sandy soil and loam are best fitted for sewage irrigation, and that clays are least fitted for this process. Dr Frankland says, page 760, "The cleansing power of a soil seems to be more closely connected with physical conditions, as regards porosity, fineness of division, etc., than with the chemical composition of the soil. Thus, the Beddington and Barking soils, whilst similar in chemical composition, are most widely dissimilar in their action upon sewage. Again, sand and Hambrook soil act very similarly on sewage, whilst they differ considerably in chemical composition; and lastly, the Hambrook and Dursley do not differ very widely in their chemical composition, nevertheless, the latter has more than twice the purifying power of the former."

At first it was supposed that the mere flowing of the sewage over the earth was sufficient to purify it; but it is now considered better to underdrain the soil, and not to allow any surface water from a sewage farm to overflow into any stream. In surface irrigation it is right to provide land which requires to be carefully prepared, both by being underdrained and also by giving the surface a sufficient slope, so that the sewage may flow evenly over it. In surface irrigation the sewage may be applied in three ways, technically termed the catch-water, the pane and gutter, and the bed systems. The catch-water system is a series of gutters, the tail of one forming the head of the next. It answers well in undulating ground, and has this advantage, that if there is an overflow from one gutter it will be caught by the next below, and so no unpurified sewage will be allowed to pass into the stream. As its name indicates, the pane and gutter system is to lay out a rather flat piece of land with a main carrier, from which several small gutters or carriers pass all over the entire plot, cutting it up into divisions. The bed system consists in laying out the land in ridges, with narrow furrows between. The advantages here are, that the sewage passes along the furrows and feeds the roots of the plants growing on the ridges, while on them vegetables and root crops may be raised. This last is a great advantage, because if we are confined to Italian ryegrass it would be most difficult to get a market for it.

The accounts given of the cost and results of sewage farming are so conflicting, that it is very difficult to give a fair and honest statement of its pecuniary results. But as this part of my subject would be incomplete without some such notice, I shall briefly endeavour to allude to it.

One of the most recent and most authoritative utterances on sewage disposal is a report to the Local Government Board,[1] which is largely taken up with this question. Before entering into details, however, I would advert to one or two conclusions stated in the beginning of the report. In the second, we are most rightly told that "the retention for any lengthened period of refuse and excreta in privies, ash-pits, or in cesspools, or at stables, cowsheds, slaughter-houses, or in other places in the midst of towns, must be utterly condemned." The reporters are evidently not aware, that by the present system of water-carriage, a large portion of fæces are retained in dwelling-houses and on the house side of traps till partial decomposition takes place. Thus their very proper condemnation of the retention of putrescible matter is an unintentional condemnation of water-carriage. Number 3 advocates the pernicious error of carrying off subsoil water, surface water, and domestic drainage by the same carriers. It is surprising that such acute and able men as the commissioners do not see that if subsoil water can find its way *into* the sewers, the contents of the sewers must of necesssity also flow *out*, and may occasion much danger by the pollution of the earth and any wells in the neighbourhood. Number 9 recommends that towns on the sea-coast, or on tidal estuaries, may be allowed to run the sewage into the sea *below the line of low water*. The italics, which are ours, show that the discharge pipe will be sealed at all times by a weight of superincumbent water, varying according to the state of the tides, and that no free discharge can take place until the weight of the sewage in the sewer is greater than the weight of a column of the superincumbent sea over the mouth of the outlet. As the pipes conveying the sewage can never be emptied, while during the rise of the tide there must either be retrogression or stagnation of the fluid, it follows that there will be a great tendency to deposit the suspended matter in the sewage; and a still greater sanitary evil is, that as the tide rises the sewage gas will be forced back into the towns or houses. It should be mentioned that this recommendation to pass sewage below low-water mark has this rider, "provided no nuisance is caused." Even if the stagnation of sewage and the escape of sewer gas is not considered a nuisance, the sewage itself floats, as we have seen, on the surface of salt water, and slowly decomposes, giving off offensive gases in the process. I cite but one example of the results from discharge of sewage into the sea. Formerly there were at Brighton eight outfalls into the sea, of which Mr Hayter says, "The specific gravity of the sewage being less than that of the sea water, the sewage rose to the surface, and even at the old central outfall at the Steyne, which was 1·760 feet from the shore and further seaward than any of the others, the stream of sewage was plainly visible from the shore; and to those who went in boats and came near the point of discharge, the effluvium was unpleasantly evident."

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[1] Report of a Committee appointed by the President of the Local Government Board to Inquire into the Several Modes of Town Sewage, 1876.

Mr Lockwood, burgh surveyor at Brighton, said—"There was to be seen, when it rained, a yellow patch of water, which gave alarm to visitors when they were told what it was."[1]

An eminent engineer attempted to remedy this state of matters by building an intercepting sewer 7½ miles long, with ventilators at every two hundred yards along the line. The result has not been quite satisfactory, as is shown by the following quotation from Messrs Robson and Meliss's book, pages 177–8:—

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[1] *Purification of Water-Carried Sewage.* By Henry Robson, C.E., and John Charles Meliss, C.E. London, 1877. Pages 176-7.

"How far success will permanently attend placing the out-fall at Portobello remains to be seen; but no sooner was the work completed than a new difficulty arose, viz., that of sewer gas. This trunk sewer, 7¼ miles long, and averaging 6 ft. in diameter, has its outlet closed by the sea to such an extent as to be rarely able, if ever, to completely empty itself. It is clear, then, that the sewer became practically an enormous elongated cesspool. Large quantities of sewer gas generated, more than could escape through the ordinary ventilators, and as the tide rose, the sewage rising in the sewer would diminish the space available for holding gases, and they would be forced up the branch drains into the houses. Mr Abernethy states that a similar intercepting culvert to that at Brighton had been made at Aberdeen, and it was found that during the period when the tidal valve was closed and the sewer had no outlet, the noxious gases generated in the main culvert found their way up the various drains and subsidiary sewers into the higher part of the town. During this stagnation of sewage another evil also occurs, the solid matter deposits, and a large accumulation of sludge takes place in the sewer. Although the works were only completed lately, complaints have already been made on the subject, and the Brighton authorities have been obliged to endeavour to meet these difficulties by introducing a ventilating arrangement, consisting of a furnace and chimney, to produce a draught through a portion of the sewer about one mile eastward of Kemp Town."

(*To be continued.*)

Part Second.

REVIEWS.

The Liverpool and Manchester Medical and Surgical Reports. Edited by JOHN WALLACE, M.D. Liverpool: A. Holden. Manchester: T. Roworth. London: J. & A. Churchill.

IT is two years since we reviewed the last issue of these Reports, and we are somewhat in doubt as to whether the volume before us belongs to this year or last, as 1877 is on the wrapper and 1878 on the titlepage. The production is a little remarkable for the loose way in which it is edited, and we feel inclined to suggest to the

460 gentlemen whose names appear in the "list of subscribers," to make choice of an editor who is not too busy or too careless to attend to his editorial duties. In a daily or weekly paper we are ready to overlook an occasional ungrammatical sentence, or a little bad spelling and punctuation; but when a volume which has taken two years to produce is sent out as full of errors as a first proof, its readers will scarcely be so lenient.

It would take up too much space to attempt to give examples of the bad grammar contained in the Reports. Suffice it to say, they are not less noticeable than the typographical errors, of which we shall instance a few. In one article we find "formentations," "Lig. Morph.," "medcine," and "casualities"—this last word occurring three times. In another article appears the following line: "I efective in erinary salts and of very low specific gravit;" and, on the same page, "sulphuric lether." Elsewhere we notice "midewife," "unitocular," "cantery" (twice), and "foreunner." Leucocytes appears in one place as "lecocytes," and in another as "lencocytes;" and in a short paragraph at page 105 we read of "blood powered out," and of the bowels being "kept regular during pugnancy." The name of the contributor of one of the papers is ill-spelt in two places, and so are the names of more than one of the quoted authors, Hippocrates among the number.

We shall say no more on this topic, but proceed to criticize the work itself. Should it contain good useful matter, we can afford to make light of a few score of "literals."

It opens with a paper by Mr Hugh Owen Thomas on "Past and Present Treatment of Intestinal Obstructions," occupying about a quarter of the whole volume. This is quite an ambitious treatise on obstructions, beginning with "some of the opinions held regarding them and their treatment by the ancient practitioners of medicine," and ending with fifteen conclusions; but we think a little judicious condensing might have improved it. The author's strong point is certainly not diagnosis—indeed, he appears to soar above this as an amiable weakness of less practical men. "It may be broadly stated," he tells us, "that a differential diagnosis is easier guessed than demonstrated. Under these circumstances it is a source of satisfaction to know that a differential diagnosis is not necessary to successful treatment. It may be asserted, as a general rule, that the treatment is similar for all the varieties of intestinal complications." And what is the universal panacea? It was scarcely necessary for Mr Thomas to prepare the minds of his readers for the reception of the revelation he had to make by entering upon a deliberate discussion of all the treatments suggested since the time of Hippocrates. Practitioners do not need to be cautioned against applying a live kitten to the stomach, or against copious blood-letting, or the exhibition of dried viscera, apple dumplings, lead bullets, and crude mercury. And after all this "leading up" to the main point of his paper, all the author has to propose is "confining the patient to the inclined position, with pelvis raised and trunk dependent," and the subcutaneous injection of *liquor morphiæ*, which, "when correctly and opportunely administered, is as certain, safe, pleasant, and successful in its action as all the previously-discussed drugs and modes are uncertain, unsafe, painful, and disastrous." The treatment, we are further told, "involves a restriction of quality and quantity of food, and limited libations of drink;" and in cases where the morphia and careful dieting fail, the author advises recourse to gastro-enterotomy. Possibly, for the purpose of showing what is meant by "limited libations," and doubtless also to allay the groundless fears of timid disciples, Mr Thomas inserts the following true story:—"I have known the case of a sufferer from acute enteritis who retained nothing but a drink of iced water frequently repeated in small quantities for forty-nine days, and yet recovered at the end of that long period of abstinence not much emaciated, though previous to this complication the patient had suffered from another painful affection." The article abounds in what may be called little inelegancies of style, which with moderate care might have been eliminated. Take the following two sentences as examples; they occur close together:—"The subcutaneous administration of opium, belladonna, digitalis, are more uniform and potent than when given by the mouth." "In this monogram (*sic*) is to be found a very full, able, and systematic description of the etiology, diagnosis, prognosis and treatment; and there appears a decided progress towards the opium method, which he advocates, but also advises enemas of water only."

Next follows a paper by Dr James Ross on "Bacteria not essential to Infection." Here the author of the graft theory of disease once more enters the lists against the germ theorists. Much of his force is, however, wasted in attempts to dislodge his antagonists from positions which they have never taken up. For instance, we are told "the particles found in vaccine lymph are not at all similar to the organism found in putrefactive fluids." Then from an imperfectly sealed tube Dr Ross obtains lymph turbid at both ends, and finding the turbidity due to rod-shaped bacteria, remarks that "the genesis of the rod bacteria at the two ends, which had been in contact with air, show that they have been generated from germs introduced from without." Surely the author is not at issue with the germ theorists on this point. Do they not admit that lymph, like other albuminous fluids, is subject to putrefactive changes, and that the multiplication of contagious particles in sound lymph is a very different process from the multiplication of bacteria in putrefying lymph?

The third paper is by Dr Shearer on lead-impregnation, in which the reader is gravely told that "the great object of treatment is to get the poison out of the system—nervine tonics, galvanism, chalybeates, and blood-restoratives are all useless until elimination is effected." The observation is no doubt the outcome of much practice and research, but we have a vague notion that we have seen something like it elsewhere.

More interesting, because less pretentious, are some of the shorter contributions to the Reports, as the notes "On Chronic Rhinitis," by Mr J. Dixon Mann; the "Two Cases of Ovariotomy, with Remarks," by Mr Bontflower (? Boutflower); the "Notes on the Pathology of Plastic Bronchitis," by Dr Caton; the "Cases of Antiseptic Osteotomy," by Mr W. M. Campbell; and Mr Grosholz's "Notes on Forty Cases in which the Operation of Version was Performed." All these papers are interesting, because they are simply records of clinical experience, and do not aim at being anything more. What better offering can a practitioner make to his professional brethren than the particulars of a case faithfully reported? It is doing truer service to the profession to present such particulars, without comment, or with the addition of a short paragraph only, drawing attention to any special point of interest, than to employ them as the text for a long dissertation that few, even among the author's personal friends, will take the trouble to read. Certainly such contributions conform to one's notions of *Medical and Surgical Reports* more closely than elaborately vamped up articles on past and present treatment.

Injuries of the Eye, and their Medico-Legal Aspect. By FERDINAND VON ARTT, M.D., Professor of Ophthalmology in the University of Vienna. Translated, with the permission of the Author, by CHARLES S. TURNBULL, M.D. Philadelphia: 1878. Pp. 198.

THIS work cannot fail to be more or less valuable, considering the large opportunities and eminence of its author; but we are not sure that it is fitted to be very useful either to professed ophthalmologists or to ordinary practitioners. The former do not stand much in need of it, the latter will be oppressed with the numerous distinctions and details into which it enters. It partakes too much of a system, too little of a monograph. It is better suited, in our estimation, for the German than the British mind. With regard to the translation we would say that, while probably conveying a tolerably accurate conception of the original, it is not characterized by much attention to the idioms, the niceties, or elegancies of the English language. The preface led us to expect something very different. "It remains for the translator to explain any casual deviation from the strict text of the original which may be found in this volume. He has deemed it preferable, in justice to those who would make use of the translation, and to whom a clear exposition of the leading facts is more desirable and of greater interest than a painfully accurate and verbal translation of German forms of expression, to avoid all such *renditions*." The last word is new to us, but it is one of many similar innovations occurring throughout the work.

Our space prevents us from entering into details. We are surprised at the severe treatment recommended in cases of abscess of the cornea following contusion, and accompanied, as is often the case, by hypopyon. We are in the habit of treating such cases by simple evacuation of the aqueous humour, as recommended long ago by Wardrop; and if this is done at an early period after the accident, the more serious symptoms are often prevented. Even when the abscess is large, and the pus in the anterior chamber abundant, the case is seldom hopeless, if a horizontal incision is made with considerable freedom. But we should hesitate before performing the operation recommended by Dr Artt. "The eyeball being well fixed, the knife of Graefe, with its edge directed forwards, is passed through the still normal corneal tissue at one margin of the purulent accumulation; it is then pushed closely behind it through the anterior chamber, and made to emerge near the opposite margin in such a manner that the counter-puncture shall fall in normal corneal tissue again. Then, without fixing the eyeball, the section is completed by drawing the knife slowly from behind forwards, the back of the knife remaining directed while this is being done to the centre of the curvature of the corneal surface. If, for example, the abscess occupies the central region of the cornea, the points of puncture and counter-puncture can be so chosen that the section will run in the horizontal meridian, dividing consequently the cornea into an upper and a lower half. . . . . Our object is to pass through the cornea in a vertical direction, so that the section shall not be a curved but a linear one—that is, one following the greatest circle of the cornea, for it is such a section alone which will afford the necessary gaping of the margin of the cut to secure the curative object." The following sentences are not very reassuring:—"It may happen that the section alone produces a permanent and progressive improvement, but it is also possible that this result is only achieved after a re-opening of the cut, even as often as ten times. Among a large number of cases treated in this way, notwithstanding the most implicit obedience of the patient and the greatest care on the part of the physician, we have sad occasion, now and then, to regret the loss of an eye or even of its fellow."

The reader will find some important suggestions on a careful perusal of the volume, although we are not sure that it will supersede that which Mr White Cooper published on the same subject some twenty years ago.

The Devil Demonstrated by a Physiologist. Printed for the Author.
J. Ogder & Co., 172 St John Street, E.C.: 1878.

This is a brochure of 32 pages. It contains an interesting account of the accepted views of physiology revealed by microscopic observation, and is so far deserving of commendation; but when the author ventures on the domain of theology and psychological speculation, he is wofully at sea and beyond his depth. He admits of no personal author of evil, no prince of darkness, no accuser of the brethren. His "devil, spirit of evil, is merely the forces combined with the flesh exciting desires in the brain, some of which, if gratified at the expense of others, or given way to excess, are inimical to the individual, and therefore evil." With candour and *naiveté* he tells us in the preface that "The Devil" was written some twelve years ago, and was submitted to friends in whose judgment he had confidence, the result being that it was returned to his desk for ten years. His friends gave sound advice, we think, which ought to have been followed for a still longer period, for the little work is manifestly an apt illustration of the Horatian adage, *ne sutor ultra crepidam.*

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LVII.—MEETING VIII.

Wednesday, 15*th May* 1878.—Professor Sanders, *President, in the Chair.*

EXHIBITION OF PATIENTS, ETC.

I. *Dr G. W. Balfour* showed a lad, æt. 22, suffering from diabetes, who had gained over two stones weight in three months. A year ago he was passing 400 oz. of urine, and in September last when he came under his care, he passed, while using diabetic diet, about 200 oz., containing 16 oz. of sugar. Every known method of treatment was tried, but he went steadily down-hill until he came down to seven stone, when he would have been sent home if he could have borne removal. Some years ago he had treated diabetes with lactic acid, according to the theory of Cantani of Naples. This treatment was now known not to answer in all cases, and it was even doubtful if the theory were true. Believing that the liver was the organ primarily at fault, and that it might be influenced in various ways through the nervous system and through the compositions of the blood, or reflexly by acting on the terminations of the ductus comminus, he had, as a *dernier ressort*, put this patient upon nitric acid, 20 mm. four times a day. The result was most remarkable and encouraging. There was marked improvement from the very first, and now the urine had fallen to 50 oz., containing 1 oz. of sugar. He was still taking diabetic diet, viz., animal food, skimmed milk, and bran biscuits. This case was another proof that incurability was not an attribute of the disease, but rather an indication of want of resources on the part of the physician.[1]

II. *Mr Chiene* showed a PATIENT illustrating Dr Symington's paper. This patient had been operated on a month ago. When admitted into the Infirmary he was totally unable for any exertion, even that of turning in bed. He was now free from pain, and about to return home. He regretted that another patient, on whom he had operated a year ago, had not arrived in time to be shown.

III. *Dr John Duncan* showed a TUMOUR removed from the NECK of a WOMAN, aged 40. It was a sarcoma, and had been exceedingly difficult to dissect out. It was on the right side of the neck, beneath and adherent to the sterno-mastoid as well as to the skin. He had to dissect most carefully for 2½ hours, the difficulty being that there were adhesions to the carotid sheath for about 2½ in. The projecting part they saw passed in between the artery and vein, so that in removing it the vagus was exposed.

IV. *Professor Annandale* showed a new form of TOURNIQUET, simple, cheap, and effective, suggested by Dr Arthur Spohn, of Texas, consisting of a hollow indiarubber ring made of a suitable size. He had now used it in several amputations, and found it carried out Esmarch's bloodless plan to perfection. He wished to bring it under the notice of the profession on this account, but he also thought that from its simplicity it could be easily used by railway-guards, soldiers, and others in cases of accident. The rings were of various sizes, so as to suit different limbs.

V. *Mr D. J. Hamilton* showed the BLOOD from a DIABETIC PATIENT, aged 10 years, who had been under Dr Linton's care at the Sick Children's Hospital. The diabetes had lasted for six years without any great inconvenience to the patient. Two days before her death, however, she suffered from difficulty in breathing, delirium, and coma. Under appropriate treatment she rallied somewhat, but ultimately the coma returned, and the patient died. On post-mortem examination the blood taken from the heart was found to present a remarkable appearance. After standing in a vessel it separated into two layers, one milky in appearance, the other normal. When the body was opened the viscera had a peculiar odour like sour beer. The case was of interest in relation to the pathology of sudden deaths from coma, where acetone was found on distillation of the blood. Through the kindness of Dr Aitken and Dr R. M. Morison, the blood from the child was distilled, with the result of obtaining this distillate which, as they could satisfy themselves, had the peculiar smell of acetone. It was only faint, however, as compared with that of some pure acetone he now had. The characteristic test was to add solution of potash and mercuric chloride, when a yellow precipitate formed. This readily dissolved in excess, and gave a white precipitate when boiled. The theory of Balthazar Foster as to the coma being caused by the acetone could hardly be supported by this case, as there was so little present.

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[1] Since this case was reported, Dr Balfour has sent away another young diabetic female from the Infirmary, much improved as the result of the treatment with nitric acid.

VI. *Dr Symington* then read a paper on the PHYSICS OF NERVE-STRETCHING.

Mr Bell, as one of the few who had stretched the great sciatic nerve, wished to express his obligations to Mr Symington for his paper on the physics of nerve-stretching. When he operated he exposed as much of the nerve as he could hook up easily, and then pulled it until he had an uncomfortable feeling as if he were tugging at a vegetable with long roots about to yield. The last patient on whom he had operated was sent in from the country by an able young physician, who had tried all remedies without benefit. Turpentine, castor-oil, iodide of potash in large doses, and the cautery, had all failed. The nerve-stretching, however, had resulted in a perfect cure.

Mr Chiene was interested in Mr Symington's experiments. He had operated on three patients, two of whom had been ill for a year, and one for five months. The operation was an easy one. A straight incision one inch long through skin and fascia exposed the nerve in the angle between the gluteus maximus and biceps. The finger was then hooked round the nerve, the nerve raised from its bed and an upward and downward tug given. He did not lift the leg of the patient from the table. In all his cases hitherto the pain had disappeared after the operation. The pathology of sciatica was still obscure, and much required to be observed yet as to the state of the nerve-sheath, etc. In two of his cases he had noticed a varicose condition of the veins of the sheath; in the other the nerve was apparently healthy. In certain intractable cases, *e.g.*, when the patient could not turn in bed, the operation was perfectly justifiable.

VII. *Dr A. G. Miller* showed the INSTRUMENTS used in Japan for the TREATMENT of SCIATICA. They were fine needles with gold and silver handles. From their flexibility they were very difficult to pass. The native surgeons were very successful with them.

Dr John Duncan said that Syme's dictum on acupuncture was, that they should put the needles down to the bone, and leave them there for an hour or two. He thought he was wrong on this point, and that the needle should be put into the nerve. If this were always done acupuncture would cure more cases than was at present believed.

Dr G. W. Balfour had found acupuncture or morphia injected directly into the nerve perfectly successful in all purely neuralgic cases of sciatica, even when of many years' standing, if persevered in long enough. One case in which the disease had lasted six years took about as many months' treatment. Of course in malarious sciatica quinine must be given largely. In scybalous sciatica purgatives must be employed, and in rheumatic and other forms other appropriate remedies must be conjoined. But cases due to malignant disease were incurable by this plan or by nerve-stretching either, and it seemed to him that nerve-stretching was not free from possible ulterior dangers as yet unknown.

Dr Carmichael wished to know if living was stronger than dead nerve.

Dr Symington explained that Bentheim had found from experiments on dogs, that the strength of the nerve slightly increased after death.

Dr A. G. Miller mentioned that he had found carbolic acid ($\frac{1}{10}$) coagulate nerve tissue so as to destroy its conductivity. Might not a spray of $\frac{1}{10}$ on the nerve have some effect in producing relief from pain?

VIII. *Dr Duncan* then read a paper on the MODES OF ADMINISTERING MERCURY IN SYPHILIS, which appeared at page 97 of this Journal.

Dr Cadell had listened with interest to Dr Duncan's account of the modes of administering mercury in syphilis. He himself found fault with the giving of mercury at all, as he believed it only did harm. The latest fashion was to give it in tonic doses. In his own practice he rather gave other tonics. Most mercurialists had now given up the use of mercury as a specific; but if given as a tonic we had better ones in use. He had never failed to get good results from simple non-mercurial treatment.

Dr W. A. Jamieson said that Dr Duncan, in giving the four methods of mercurial administration, had omitted to state at what stages they should be employed. Kaposi and Newmann used emplastrum hydrargyri (Austrian Pharmacop.) as a local dressing in chancres. In two cases seen by him there had been great improvement. He thought fumigation might cause awkward results, and believed inunction to be the best plan in children.

Dr A. G. Miller disagreed on one point, viz., giving mercury to produce salivation. Mercury should be given as a tonic, and its effect on the enlarged lymphatic glands noted. When these glands are softening, then the patient is doing well. He, accordingly, gave mercury by the mouth, and used it locally over the enlarged glands. Dr Cadell had alleged that no case was benefited by mercury. He had seen a stricture of the rectum in a child disappear under the internal administration of calomel.

Dr Duncan said that he could hardly argue the point with Dr Cadell, as his paper was simply on the modes of administering mercury. He agreed with Dr Jamieson as to inunction being the best method of giving mercury to children. Dr Miller had misunderstood his views as to salivation. He did not say that mercury should be pushed to salivation, but that salivation was the best proof of its action. Ordinarily, he thought soreness of the gum enough. He did not agree with Dr Miller in making the diminution of the glands a test for the action of mercury, seeing they were only one manifestation of syphilis, and not an important one.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXVII.—MEETING XII.

Wednesday, 12th June 1878.—Dr WILSON, *President, in the Chair.*

Minutes of last meeting being read and approved—

I. *Professor Simpson* showed a preparation of great interest, viz., the OVARIES removed from a young lady, æt. 35, who, from the beginning of her menstrual life, had been a sufferer from dysmenorrhœa. She had been for long under the care of the late Mr Carmichael, and at that time was frequently seen by Sir James Simpson, who divided the cervix, but without any permanent relief. When she came under his (Dr Simpson's) care, he found her suffering from piles; and, thinking that these might be keeping up irritation, he tied them. He got a great fright, as during the operation she very nearly died from the effects of chloroform. Still the dysmenorrhœa continued and made her life miserable. Every month she had one week of agony, one week of debility and weakness following, and another in which she dreaded the recurrence of the attack. In this way she had only one week every month free from pain. A year or two ago he told her that, in America, they were bringing on the menopause by removal of the ovaries. In March, she asked him again about this; and, while he said it could be done, he rather shirked it, so that the patient remarked one day that she thought *he* was funking it now. Battey, the originator of the operation, had at first made a mistake in operating vaginally, and failed in some cases to remove all the ovaries. He had operated in his case suprapubically, chiefly because the left ovary was adherent. On Monday last, with the assistance of Dr Berryman, Dr Croom, Dr Hart, and Mr A. H. Barbour, he removed both ovaries and part of the left Fallopian tube. So far, there had been no reaction. Her temperature had not risen above 99°·8 F., and her pulse was only 96, so that the ultimate prognosis was favourable. He intended to record the history of the case more in detail after sufficient time should have passed to observe the result of the operation. Meantime he thought the Fellows would be interested in seeing the fresh preparation.

II. *Professor Simpson* showed an EPITHELIOMA OF THE CERVIX UTERI, removed by the galvano-caustic wire. At the time of operation there was free bleeding. He at first thought of pulling open the parts and exposing the bleeding surface; but as he knew the septum separating the anterior fornix-vaginæ from the peritoneum was very thin, and might have been torn through, he refrained from doing so, and therefore applied a plug soaked in perchloride of iron. This was a mistake, as the patient died on the fourth day, and on post-mortem examination the cause of death was found to be general peritonitis, mainly in the pelvis. The cause of this was very easily seen to be due to the perchloride of iron corroding through the thin septum into the peritoneum.

III. *Professor Simpson* exhibited two small, round-celled, SARCOMATOUS TUMOURS from the vagina. Although not imposing in appearance, they were, so far as he knew, unique. Cases were not unknown of sarcoma vaginæ occurring as a secondary affection, where the disease had first appeared in the uterus. He had himself had a case where the vaginal wall had probably been injured during the operation for the removal of a uterine sarcoma, and when the tumour was reproduced in the uterus, it was found grafted also into the vaginal wall. But in the patient from whom the present preparations were removed the uterus was quite healthy.

IV. *Dr Croom* showed a PREGNANT UTERUS of about four and a half months. The patient had died of uræmic convulsions.

V. *Dr Croom* exhibited a preparation of TWINS. When he first saw the mother he found one fœtus expelled, dead and shrivelled; a second and larger fœtus was afterwards born healthy. The placentæ were separate, united only by a thin fibrous septum; that of the second fœtus was healthy, the other was fatty.

VI. *Dr Croom* showed the LABIA MINORA of a patient which he had removed for hypertrophy and elongation causing the patient great discomfort from frequent attacks of inflammation.

VII. *Dr Craig* exhibited the PLACENTÆ (separate) from a case of twins; the separate bags of membranes being united in the usual manner.

VIII. *Dr Young* mentioned a case of PECULIAR PRESENTATION he had met with, viz., arm over head and prolapse of the cord. The child was born dead. When first called to the patient the liquor amnii had escaped, the cord was prolapsed, and the right arm across the parietal bones. He endeavoured to repone the funis, and turned the child without difficulty under chloroform. The child was dead; the mother made a good recovery.

IX. *Dr James Carmichael* exhibited Thomas's DULL WIRE CURETTE, as recently described by Dr Paul F. Mundé of New York, in a paper communicated to the Society. He had lately used it with very satisfactory results in a case of retained placental fragments after abortion. He alluded to the necessity of operating exactly in the manner described in Dr Mundé's paper—patient on left side, cervix exposed by Sim's speculum, and uterus drawn down by tenaculum attached to the anterior lip of the cervix.

X. *Professor Simpson* showed the preparation from a case of PELVIC HÆMATOCELE which he had had under observation in his ward in the Infirmary. The patient, a quadroon, æt. 21, puella publica, had had a child nine months previously to her admission, which only lived three hours. She had been syphilitic for several years. Menstruation was irregular; but she had missed her period so distinctly four months before admission that she thought she might be again pregnant. She had, however, irregular discharges of blood, and began suddenly in the end of February to have intense pain in the abdomen, nausea, and vomiting, with alternate heats and chills. She was admitted on 9th March with great abdominal tenderness and tympanitis, and a dull swelling, rising to within an inch of the umbilicus; vagina hot and tender; cervix uteri low, and os patulous; all the vaginal roof filled in with a hard mass, which was continuous with the supra-pubic swelling, and in which the outlines of the uterus could not be felt. The whole was very sensitive. Pulse 126; temperature 103°. A sedative and expectant treatment had been adopted. The swelling had become very much reduced and the general condition improved, till on 1st April the patient had an attack of pneumonia, after which she grew rapidly worse, and after passing some bloody stool on two successive days, she died on 15th April.

At the autopsy there had been found very extensive peritonitis, the inflammatory deposit on every abdominal organ; the peritoneal surface stained of a dark colour as high as the umbilicus in front and up to the kidneys behind; the intestinal coils matted together; a perforation near the lower end of the small intestine; a quantity of grumous blood in a cyst in the right lumbar region, and a still larger quantity in the pelvic cavity, which was a mass of putrilage, with the outlines of the various organs destroyed and decomposing. No trace of an ovum could be found, but the right ovary was enlarged, and presented a cavity that might hold a filbert; and at the right side of the fundus uteri there was a perforation through the walls, wide as a shilling, on the peritoneal surface, but narrowing towards the cavity of the uterus till it was just sufficient to pass a sound.

It was the first fatal case he had seen in the ward, all the others having recovered, usually under an expectant treatment.

Dr Burn had seen a few such cases. One at present he was attending, in a young unmarried patient. In married women, the fixation of the uterus which generally resulted, often in his experience, predisposed to abortion.

Dr Croom thought two points interesting in the cases, the very large quantity of blood effused and its rapid absorption, as well as the extensive hæmorrhage from the uterus.

Dr James Carmichael mentioned a case which Professor Simpson had seen with him. The patient, 19, unmarried, died of peritonitis during the menstrual period, a large quantity of blood having evidently escaped into the peritoneum.

Dr Young mentioned a case of hæmatocele with large bleeding. Recovery was very slow; treatment expectant.

XI. *Dr Underhill* read notes of THREE CASES OF ACCIDENTAL HÆMORRHAGE, which appears at p. 200 of this Journal.

The *President* commended the paper, and agreed with Dr Underhill in regard to treatment. He did not consider plug often necessary.

Dr Gordon thought rupturing the membranes, as a rule, efficient to stop bleeding; but when it failed, our difficulties were increased in emptying the uterus. He thought it better, perhaps, to turn in these cases.

Professor Simpson agreed with Dr Gordon in thinking it not advisable to rupture the membranes as a routine practice, since it increased the difficulties of the after-treatment, and occasionally did not stop the hæmorrhage. Another point was that Dr Underhill spoke as if accidental hæmorrhage was not a dangerous complication. He had seen fatal cases, and never liked to meet it. One of his last cases occurred just before he left Glasgow. One evening when he had got home from his rounds, the husband of the lady, who was a primipara, and about the eighth month, was waiting for him with the message that his wife did not feel very comfortable, but that it was nothing very important, and would not need a visit that evening. He went, however, and found that the lady had tripped while walking quickly, and that there had been a little bleeding. Both lady and child were dead by two o'clock the same morning. He never therefore felt comfortable in such cases. In another case he had seen some years ago with the late Dr Young, George Square, forcible dilatation was used. His opinion was that in such cases they should never be far from the bedside, and that the *os* should be dilated with Barnes's bags, or, if too small with a sponge-tent. The first case he had seen after his return to Edinburgh was along with their Nestor, Dr Burn, where both mother and child lived. In this case the placenta was diseased.

The paper was extremely interesting, and the cases well narrated.

Dr Croom, in any cases he had met with, had found that the treatment recommended in the paper had been quite successful, although none of his cases had been of a very serious nature.

Dr Murray mentioned a case of sudden death at the full time.

On post-mortem examination the uterus was filled with blood and placenta detached.

Dr Burn had seen indentation of placenta from clots. As a general rule, if os was well dilated, rupturing membranes and ergot were usually successful. He had found, however, difficulty in turning.

Dr Underhill thanked more especially Professor Simpson and Dr Burn for their remarks. In his second case, had he to attend it again, he would have contented himself by rupturing the membranes and giving ergot.

MEETING XIII.

Wednesday, 10th July 1878.—Dr WILSON, *President, in the Chair.*

Mr Donald M'Raild, F.R.C.S., Greenock, was admitted an Ordinary Fellow.

I. *Dr James Young* exhibited a POLYCOTYLEDONARY PLACENTA which had an extra cotyledon attached at a short distance from the general placental mass, by a thin membrane. The patient was a primipara. There was only one child.

II. *Dr Peel Ritchie* exhibited a CORD with a knot upon it. He observed he would not have brought it before the Society had not he recently met with two instances of knotting which presented some features of difference, but agreed in the length of the funis being greater than the average. In the one shown, the cord measured 42 inches, and at delivery was twice coiled round the child's neck. The knot was 14 inches from the umbilical end, and consequently close to the neck of the child. The movements of the fœtus in this instance had been very lively during the whole of the latter half of pregnancy. Sex male. In the other instance the funis was 45 inches long, and at birth four coils of the cord were round the child's neck; but in this one, the fœtal movements were so very gentle that the mother more than once supposed the fœtus was dead. Sex female. From this it might be deduced that it was the excessive length of the funis rather than the unusually active movements of the fœtus which led to its coiling round the neck and to the formation of the knot upon it.

III. *Dr Craig* exhibited a PORTION OF THE SMALL INTESTINE which had passed through a ring formed by a small band of lymph and had become strangulated. This band of lymph was attached to the ascending colon and also to the ileum. The constriction was so tight that water could be forced through it only with great difficulty. The constricted portion of bowel was of a dark purple colour such as is often seen in strangulated hernia. The most interesting feature of this case is the fact that it was complicated with pregnancy at the ninth month. The patient was a young married woman, æt. 24, strong and healthy, and expected to be confined of her first child at the end of the present month. She was in her usual health till 7 P.M. on Saturday, 6th inst., when she suddenly felt very unwell and went to bed. For several hours she had severe pains every few minutes, and both she and her friends thought she was in labour. I saw her about 11 o'clock on the same evening, and on making a vaginal examination found that the os was high up, that the cervix was elongated, and that no presentation could be made out, as the os had not begun to dilate. I administered two grains of opium, and ordered another grain to be given three hours afterwards if the vomiting and pain continued. I again saw the patient about six o'clock next morning, and found that the pain and vomiting had continued all night; but the os was still high up and had not begun to dilate. I now ordered powders containing morphia and bismuth, and also ordered some morphia suppositories. I next saw the patient about midday, and found that the pain and vomiting had both considerably abated. About 7 P.M. the same evening I was sent for, and found that the pain and vomiting had both increased, that the pulse was quick and flickering and scarcely perceptible at the wrists, that the extremities, especially the hands, were very cold, and that the patient was in a state of collapse. The condition of the os uteri was the same as before; the bowels were loaded with fæces; the abdomen was tender to the touch, but not tympanitic to any great extent. The uterus was lying to the left side, and the skin of the abdomen immediately over it was somewhat discoloured. No fœtal heart could be heard. I now sent for Professor Simpson, who happened to be out of town; but Dr Keiller kindly came and saw the patient with me. By the time Dr Keiller saw her, she was quite pulseless at the wrist, and no pulsation could be felt in either the carotid or subclavian arteries. She suffered occasionally from delirium. The catheter was passed by Dr Keiller, and a small quantity of urine was drawn off. It was natural in colour and contained no albumen. An enema was also administered, and a quantity of fæces was brought away. Dr Keiller ascertained that the child was presenting naturally, and that labour had not yet commenced. He could not detect any sounds of the fœtal heart. He recommended that brandy and tea should be administered at short intervals. Labour commenced on Monday morning, about 5 A.M.; and shortly after midday she was delivered of a dead female child. The child had been dead for some days. The placenta came away easily a few minutes after the birth of the child, and, though the patient was now quite conscious, within five minutes afterwards she was dead. There was no hæmorrhage, and the uterus contracted well. Stimulants were administered every fifteen minutes during the labour, but the pulse never returned to the wrists. The post-mortem was made in the presence of Dr Keiller, Professor Simpson, Dr Craig, and Mr Barbour. About twenty ounces of sanguineous fluid, mixed with pus, were contained in the peritoneal cavity. The uterus

was normal and quite healthy. Dr Craig promised to give a full history of this interesting case to a future meeting of the Society.

Dr Keiller remarked that when he saw Dr Craig's exceedingly interesting and very unusual case, he had experienced no common difficulty in diagnosing its true nature. The symptoms as stated by Dr Craig were those indicating extreme collapse, and although examination failed to trace the patient's painful and evidently sinking condition to her advanced pregnancy or pending labour, still it was not easy to disassociate them at the time, and, indeed, although there could be little doubt as to the prognosis, the features of the case were such as to render it almost impossible to pronounce an accurate diagnosis during their brief course. The post-mortem examination cleared up the mystery as to the cause of the death in this case, and at least proved that the views he had expressed regarding the state of the uterus and child were correct. The deeply seated and singular nature of the intestinal strangulation so far accounted for our not clearly making out the exact nature of the case during life. Dr Keiller further remarked that the peculiar symptoms which the patient presented so reminded him of some rare cases he had witnessed of *embolism* occurring in the pregnant state, that such a possibility passed through his mind while investigating this important case, which he considered well worthy of being minutely recorded, and which he was glad Dr Craig had resolved to do on a future occasion.

IV. *Dr Buist* exhibited a UTERUS from a patient æt. 28, who died nine hours after delivery from cerebral hæmorrhage. Patient had suffered from renal disease, with albuminuria.

V. *Dr Hamilton* of Hawick communicated, through Dr Croom, the following NOTES OF A CASE OF PLACENTA PRÆVIA:—

On the morning of 10th May, at 9.30 A.M., I was sent for by a midwife to see a woman she was attending in labour, in whom "flooding" had set in. I immediately went to her assistance, and on arrival found that the patient, a strong, robust woman, had suffered from hæmorrhage to a slight extent at intervals for a week.

History.—The patient was said to be in her seventh month of pregnancy. This was her fifth confinement, and the only one in which there had been anything abnormal. She had enjoyed excellent health until the week previously, when flooding began without any assignable cause. The bleeding only occurred when she felt life. So far as she remembered, she had sustained no injury. The night previous to my seeing her, she had felt slight pains, with a little more bleeding. The midwife was then summoned, and remained with her during the night. There had been comparatively little hæmorrhage until the time I was sent for. At that time, I was informed by the midwife, there had been a prolonged pain, with a great amount of bleeding. That there had been a considerable amount was evident from the state of the bed and the condition of the patient.

Examination.—I at once made an examination to ascertain the condition of the cervix and parts. I found the os dilated sufficiently to admit one finger. The cervical canal appeared about 1½ inches in length and rigid. The vertex could be felt presenting through the placental mass. There was no oozing of blood. I at that time lowered the head, removed some of the bed-clothes, had the room kept cool, and gave an opiate, after remaining a short time. I ordered a little beef-tea, nearly cold, and acidulated drinks to be given at intervals. I then left, asking to be sent for at once should pain or hæmorrhage occur. I visited her at 9.30 P.M. From the time I last saw her there had been no pains and very little bleeding. The os was sufficiently dilated to admit two fingers; cervix flabby. Dr Brydon saw the patient with me an hour afterwards; during the hour the first distinct pain since the morning had occurred, with a great amount of discharge. The pulse was 120, regular. On examination *per vaginam* the doctor found the os and cervix in a state similar to what I have described, but he felt the vertex high up without anything intervening. I also examined and was no little surprised at the great alteration since my previous visit. The placenta was overlapping at the posterior margin of the os internum. The liquor amnii had partially escaped. There was almost no discharge of blood. We determined on plugging the vagina and allowing the os to dilate gradually. I removed and replaced the plug three hours afterwards; there had been during the interval little hæmorrhage and no pain nor change since my previous visit. She was now left under the care of the midwife, with directions to be sent for should any bleeding occur. At 9 A.M. the following morning she had a pain, with severe hæmorrhage. I was with her in a few minutes, and found that the plug had been expelled and hæmorrhage going on to an alarming extent. The pulse was very rapid. There was giddiness and all the symptoms of severe and sudden hæmorrhage. I at once made an examination and found the os dilated to admit three fingers, the cervix soft and flabby, blood running profusely. I gave two drachms of liquor ergotæ, applied the forceps, and made traction sufficient to wedge the head in the brim. The bleeding then ceased. In a few minutes there was a powerful pain, which, with the full use of the forceps, was sufficient to deliver a living child. I firmly compressed the uterus, and with a little traction on the cord the placenta came easily away. The hæmorrhage continued. On inserting the hand into the uterus I found a part of the placenta attached to the anterior margin and surface. I detached it and allowed the hand to remain *in utero* until there was contraction, which soon followed. One ounce of brandy with one drachm of liq. ergotæ was given. There was no further hæmorrhage. No unfavourable symptoms followed. The patient is making an excellent recovery. The child lived forty-eight hours.

Notes.—Until within ten hours of the completion of the labour, this case presented all the features of an ordinary one of placenta prævia. At that time the accident occurred to the abnormally-placed placenta, which made this case one of interest. Nature, striving to clear herself of the liquor amnii, and to hurry labour to the end, ruptured the placenta. An examination of the placenta showed the cause of the rupture and nature's preparation for it. That part of it which *in situ* would correspond to the os internum was thinned and dark in colour. The maternal surface was a little smoothed, the smoothness extending about one inch across.

Dr Keiller had not followed very clearly the case as detailed in the paper. In regard to the treatment generally of these cases, he thought it well not to trust so much to nature when we have ample means of artificially dilating the os, and thereby terminating the case readily and safely. Only two days ago, in an out case from the Maternity Hospital, to which he had been called by a pupil, where bleeding was going on and the os not much dilated, artificial dilatation by an indiarubber bag was adopted, and the patient delivered by turning in about half an hour. Dr Keiller, in further remarking on the proper management of cases of placenta prævia, did not pretend to say that every precaution was not taken to terminate the present case safely and well, but he was anxious to express his own view on this very practical question—a question which had been so recently, and indeed so often, before this Society, that the attending Fellows ought to be conversant with it. The point he specially now desired to insist upon was the important one of terminating such cases as speedily as possible, and for this reason that it was very seldom necessary to wait either on a certain degree of dilatation, or even of ample uterine contraction. Many lives were sacrificed or endangered by waiting for and trusting (as we ought to do in most other cases) to the ordinary natural efforts. He had long since learned the lesson—a lesson not yet generally understood—that the accoucheur need have little dread of the uterus failing to contract even in cases where it may be desirable to evacuate its contents before nature's usual time. The presence even of pains were not essential to the securing of contraction of the uterus. To those who have not as yet had the courage to trust the wonderful hollow uterine muscle as he had often, this observation may seem dangerously strange, but nevertheless it would be found to stand the practical test of experiment; and if so, why wait either for the os uteri opening up when we have simple and certain and safe means of expediting it; and why not empty its cavity at any time when such is required to save life, and which can be done, especially in cases like the present, without the dread of non-contraction. Dr Keiller strongly expressed the view he thus entertained, and cited cases illustrative of the truth of his present remarks.

Dr Macdonald agreed with Dr Keiller in his principles of treatment. Had seen a case of placenta prævia a fortnight ago.

The case was one of only partial presentation, os only admitted one finger. He decided, on seeing the patient, at once to deliver, although the dilatation was less than he had found in any case of placenta prævia he had seen before. On introducing the bags, he was astonished at the rapidity with which the dilatation was accomplished. Barnes's bags were used, and within two or three hours delivery safely effected. He thought this method at once safe and efficacious, and ought to replace all others. The proper treatment in all these cases was at once to deliver, whether pains were present or not.

Dr Keiller warmly homologated the last remark of Dr Macdonald's in regard to the necessity of speedy delivery.

Professor Simpson thought that in regard to the majority of cases dilatation by hydrostatic means was the best treatment, but he would be disinclined to tie the hands of all practitioners from adopting other methods of treatment. It struck him while the paper was being read that he would have felt inclined to adopt forcible dilatation in this case, although he must allow that one was in a less favourable position to judge of a case by merely hearing it read than by actual observation.

Professor Lusk of New York had been in the habit of using the tampon, and thought it most useful, and in many cases quite a safe method of treatment. It gave time for the fuller dilatation of the os and the progress of the labour. He found that after this plan the os usually became fully dilated, and turning and other methods of delivery were easily effected. He was frequently in the habit, however, of using dilating bags, as he had been much struck with the successful cases treated in this way, as recorded in the practice of Spiegelberg of Breslau and others.

Dr Charles Bell agreed with Dr Macdonald in regard to treatment, with the exception of the advocacy of Barnes's dilators. He preferred the air-bags, which Dr Keiller had the merit of first suggesting, to those of Barnes, as being less likely to give trouble by dropping out. In the case that had been read he thought turning would have been more appropriate than forceps.

Dr Keiller naturally enough sympathized with Dr Bell's observations and opinions regarding the so-called "Barnes's bags," seeing that he had very special, and he thought well-grounded, reasons for preferring his own caoutchouc dilators, which he in varied forms had used, and first exhibited to this Society about twenty years ago, before "Barnes's bags" were conceived or brought forth. Dr Bell was right in saying that these lost their "fiddle shape" when distended with water, and were thus rendered not only bulky but heavy, and very apt to fall out of their place, which was not the case with the more simple and equally efficient air-dilator, which he had long ago introduced, and still continued to use in preference to any other kind hitherto proposed for obstetric purposes. Dr Keiller further remarked that he now generally used an ordinary thin, soft, and therefore readily dilatable, indiarubber pessary, and such as could be easily enough introduced into and through the os, or even up into the lower part of the cavity of the uterus, where it could be made to act either as a tampon or as a dilating bag, according to the circumstances or the necessities of the special case in hand.

Dr Menzies mentioned a case of placenta prævia which had occurred in the practice of a friend of his. The child was delivered with difficulty by turning on account of contracted brim. Patient died immediately before delivery was effected.

VI. *Mr Southon* exhibited a new form of ABDOMINAL BANDAGE and made the following remarks:—

In introducing this abdominal bandage to your notice, I would just briefly enumerate the advantages I believe it to possess over appliances of a similar nature now in use.

1st, It is extremely simple, both as regards construction and method of application.

2dly, It gives adequate support from below upwards; and,

3dly, It is durable, inexpensive, and exceedingly comfortable to the wearer.

A single glance at this bandage will be sufficient to demonstrate the simplicity of its construction and the method of application.

The material used is chiefly "jean," lined with twilled calico, and bound at the edges with soft twill binding. In describing it, we may divide the bandage into three portions: the front, and two side-pieces or straps. The former has the shape of the abdomen below the umbilicus; pieces of flexible whalebone being inserted from the upper to the lower border—at intervals of about an inch and-a-half—to give it the required convexity. On either side of, and about an inch from the point, two strong flat hooks are fastened to the lower margin. These are for the attachment of the ends of the side-pieces or straps. The lower border has a tape run in it in such a manner that by pulling upon the ends a greater degree of convexity may be attained. The side-pieces are two long straps of variable length, about two and a half inches broad at one end, and gradually tapering to about an inch at the other. Those at the broad end are fastened on either side of the front by two pieces of strong elastic webbing, each an inch wide, and respectively two and two and a half inches long. Towards the small end of each strap are a number of circular eyelet holes. These are to fasten the strap to the hooks on the front. In the left-hand strap, about an inch from its broad end, is a longitudinal slit, through which the right-hand strap is passed when *in situ.*

In applying the bandage — which should be worn over the under-garment of the patient—it is simply necessary to place the front upon the abdomen, with the point resting on the os pelvis, then pass the straps around the body, the right-hand one beneath the left, until it emerges from the slit in the latter; both are then carried down to the hooks in front and secured. Care should be taken that the straps and tape are drawn sufficiently tight, so as to give the required support; which, in every case, should be from below upwards.

The surgeon, in applying the bandage, must be guided by the condition of the patient as to whether the straps shall lie upon, above, or below the crest of the ilium; as it is evident, that if the abdomen of the patient be large and very rotund, above the crest will give the best support; while, on the other hand, if small and flat, below the exterior superior spine will meet the case.

Experience has proved these bandages to be very durable, considering the material from which they are made; that is to say, when worn constantly, they last from two to three years. They are, comparatively speaking, very inexpensive, and may be supplied the profession at 7s. 6d. each, by Mr Young, surgical instrument maker, 58 North Bridge, Edinburgh. The surgeon, when ordering a bandage, should give the following measurements:—Round the body, just above the crest of the ilia, and from the umbilicus to the os pubes.

In no one instance has the patient wearing one of these bandages complained of uneasiness arising from its use, but, on the contrary, the general expression has been that they are most comfortable, delightfully easy, and exceedingly beneficial. They may with justice be recommended in cases of uterine weakness, where support is needed for the parts, and the relief experienced is sometimes immediate and marked. In tumours of the uterus, and in the pregnancies of weak women, they have been found exceedingly useful.

In one instance, a lady who had habitually miscarried at the sixth or seventh month, was enabled to carry the fœtus to the full term, and had an easy and safe delivery.

In conclusion, I might say that these bandages have been in use in private practice for several years, and the advantages of them fully demonstrated. It is true, other abdominal appliances have equal claims as far as utility is concerned, but they have generally been found either complicated, expensive, or impracticable; whilst this bandage has the merits I have claimed for it—of being simple, cheap, and useful.

Professor Simpson thought the bandage a useful one. He had applied one which Mr Southon had kindly lent to a patient in his ward, who wore it with much comfort.

Dr Keiller had frequently used a bandage of a similar nature, although larger and broader. He thought the hook at the lower part a useful improvement. He considered the comparatively light and narrow bandage now exhibited and described by Mr Southon a most excellent one, and would give it a trial. He described a form of bandage he had also been in the habit of using with trousers attached, and promised to show it and others to the Society at a future meeting.

Dr Macdonald would be glad if this proved a good bandage, as he had found great difficulties in procuring such appliances of a useful and satisfactory pattern.

Part Fourth.

PERISCOPE.

MONTHLY RETROSPECT OF OBSTETRICS AND GYNÆCOLOGY.

By Angus Macdonald, M.D.

Mental Disturbance arising from Uterine Disorders.—In the lxiv. number, page 209, of the *Obstetrical Journal of Great Britain*, Dr Richard J. Halton records and comments upon four cases of severe mental disturbance arising in connexion with non-puerperal uterine disorders. Of Dr Halton's cases two were accompanied by cervical ulceration, and the other two with menstrual disturbance. In one case the symptoms presented at first a strong resemblance to typhus fever, and the case was indeed diagnosed as such by a neighbouring medical practitioner who was called in consultation on the case. This patient had ultimately to be placed for a time in an asylum. All four cases recovered, and the recovery, according to Dr Halton, followed rapidly upon the removal of the uterine ailments.

Rheumatoid Inflammation of the Joints in Women.—At page 158, Number lxiii. of the same journal, is a short paper deserving the closest attention of gynæcologists, by N. Davies-Colley, F.R.C.S., on Rheumatoid Inflammation of the Joints in Women. Mr Davies-Colley records a series of cases in which he had observed what he believes is a form of rheumatoid arthritis special to pregnant women suffering with uterine or vaginal irritation of any kind. He maintains that it is not ordinary gonorrhœal synovitis, inasmuch as it affects not specially the knee as in the male, but quite as frequently the elbow or other joints. Besides, the subsequent course of the case was unlike that of ordinary gonorrhœal synovitis. The prognosis is favourable, only that the disease is apt to be followed by a stiff joint. The peculiarities of the disease are as follows:—It is a "definite joint disease, characterized by great pain and tenderness, and more especially by redness and œdema of the soft parts in the neighbourhood. It is accompanied in the earlier stages by febrile disturbance, which, however, I have never noticed to be considerable. Usually a mild attack is noticed in other joints before the inflammation, so to speak, concentrates itself into a particular locality. The diseases with which it may be confounded are erysipelas, phlebitis, or acute suppuration of the joint. . . . . . From most cases of erysipelas, the absence of vesication and a high temperature would form a sufficient means of discrimination. From phlebitis, the absence of the lard-like induration of the veins would probably enable us to diagnose it, although the œdema in some of the cases resembled very much that which accompanies thrombosis."

We commend this very original paper to the attention of gynæcologists, for although, as Mr Davies-Colley says, works upon midwifery fail to mention the affection, we have ourselves repeatedly seen it, and rather think most gynæcologists are aware of its occasional occurrence. We are inclined to believe it is more closely connected with gonorrhœal virus than Mr Davies-Colley is disposed to allow.

THE APPLICATION OF THE OBSTETRIC FORCEPS. — In an interesting paper upon the obstetric forceps (*American Journal of Obstetrics*, January 1878, page 48), Dr A. M. Fauntleroy advocates strenuously the advantages and safety of the instrument. He maintains that traction is for practical purposes the only power resident in the forceps, and holds that the instruments, whether long or short, ought always to be applied to the head with reference to the sides of the pelvis, and that no attempt ought to be made to adapt the blades to the sides of the fœtal head.

TREATMENT OF UTERINE FIBROIDS BY FARADISM.—In the same number, page 59, Faradic treatment of uterine fibroids is supported by Dr J. T. Everett. After a brief enumeration of nine cases, Dr Everett formulates the following conclusions as the result of his experience with this method:—

1. The Faradic current, if judiciously used, is equally potent to produce uterine contractions as the preparations of ergot.
2. It is more easily controlled, can be begun or discontinued at a moment's notice, and the dose can thus be more judiciously apportioned.
3. It never disturbs nutrition or the secretions, and does not interfere with digestion.
4. It never produces pain in distant organs, is followed by no cephalic disturbance or nervous shock.
5. It never produces inflammations or other local injury.

LAPARO-ELYTROTOMY.—The first article in the April number of the same journal is an elaborate paper by Dr Gaillard Thomas entitled Laparo-Elytrotomy: a substitute for the Cæsarean section. Dr Thomas begins with a brief reference to the history of Cæsarean section and its modern substitute laparo-elytrotomy. The latter operation was first suggested by Jörg in 1806, but first performed by Von Ritgen in 1820. The younger Baudelocque would appear to have attempted, but not to have finished, the operation. It fell into complete disuse, however, till it was introduced anew by Dr G. Thomas in 1870, he being then unaware that it had ever been previously suggested or performed.

Dr Thomas then records a series of six cases in which it was employed. Case I., on a cadaver. Case II., on a living woman in articulo mortis from pneumonia, by Dr Thomas—a living child being delivered. The latter was, however, premature, and died an hour or two afterwards.

Cases III., IV., and V. occurred in the practice of Dr A. J. C. Skene, of Brooklyn. Case III. was performed in the interest of the mother only after craniotomy. She, however, died seven hours afterwards. In Cases IV. and V. the operation was completely successful, the mothers being saved and the children being born alive. In the latter case the child died after eighteen days; in the former, it continued to live. This child weighed ten pounds. In both cases the bladder was torn during the delivery. In the former case the anteroposterior diameter of the pelvis did not measure over 2¾ inches; in the latter only from 1½ to 2 inches.

Case VI. was performed by Dr Thomas himself on a patient whose pelvis measured from 2½ to 2¾ inches in the anteroposterior diameter. The operation resulted in the delivery of a living child. Both mother and child did well. In this case also vesico-vaginal fistula was established, but it healed spontaneously by the end of the twentieth day after delivery.

Dr Thomas goes on to maintain that Laparo-elytrotomy is superior to Cæsarean section, which he calls Laparo-hysterotomy, because it avoids the risk of peritonitis, diminishing greatly the risk of incarceration of intestines and of leading to septicæmia. It is less likely to induce serious shock, and is not likely to be followed by metritis. The chief risk connected with the operation is hæmorrhage. This danger, however, Dr Thomas thinks, may always be controlled by ligature, the actual cautery, etc.

The operation is performed by making an incision through the abdominal walls, from the spine of the pubis to the anterior superior spine of the ilium on the right side of the body. The peritoneum when reached is turned up and the vagina cut into near its junction with the uterus. If need be, the cervix must be forcibly dilated before the incision through the abdominal wall is made. Dr Thomas gives the following rules for conducting the operation:—

1. The operator should be provided with a pocket case of instruments, ether, Barnes's dilators, and Paquelin's thermocautery.
2. The patient, having been anæsthetized, should be placed on a table, and the os fully dilated by Barnes's dilators.
3. The abdominal wound should be made, the peritoneum lifted, the vagina opened, and the child delivered by version, if the head or arm present; by extraction, if the breech do so.
4. The placenta having been delivered and the uterus caused to contract firmly, the iliac fossa should be cleansed by a stream of water introduced through the abdominal wound, and escaping through the vagina; and if hæmorrhage exist, ligature should be applied, if possible, through the abdominal wound to the bleeding vessels. If this prove impossible, the vagina should be dilated with a large metallic speculum, and the lips of the abdominal wound being widely separated, the bleeding points, touched by the actual cautery, carried down from above. Should this fail, the uterus should be made to contract firmly by ergot, and both vagina and iliac fossa be thoroughly tamponed with cotton, soaked in water and squeezed, but free from any styptic. Then a broad band of adhesive plaster and a compress should be applied over the lower portion of the abdomen.

5. Should no undue hæmorrhage occur, the abdominal wound should be closed by interrupted silver sutures; the vagina should be syringed out every five hours with warm carbolized water, the nozzle of the syringe being carried through the vaginal opening, and the fluid forced out through that in the abdomen. The patient should be kept perfectly quiet, nourished by milk and animal broths, and kept free from pain by opium.

KOLPO-CYSTOTOMY, OR ARTIFICIAL VESICO-VAGINAL FISTULA, is the subject of an admirable paper in the same journal, page 269, by Dr Montrose A. Pallen. It contains a tabulated record of eight cases of endocystitis treated by this method, with more or less complete relief.

The author holds that dilatation of the urethra, which has of late become so common, is of no use in true cystitis. It is of the greatest value, on the other hand, in urethritis. In order to treat such cases successfully, therefore, he recommends the most scrupulous care in diagnosis to ascertain whether of these diseases is present. This is to be effected by vaginal and vesical touch and speculum, and by a consideration of the general symptoms. A tabulated view of the distinguishing symptoms of cystitis and urethritis is then given.

The chief points on which the author depends are the following: —*In cystitis* there is always produced alteration in general nutrition, and frequently renal disease; rarely any discharge of mucus or blood, except at micturition, when pain is frequently intense; urine is most frequently acid and unfermented; frequently voided, small in quantity, and the recurrent spasm occasioned by the expulsive effort begets concentric hypertrophy of the viscus; finally, this affection usually follows puerperal affections, continued fever, pelvic inflammation, stone, etc. When the urethra is dilated under an anæsthetic, the bladder mucous membrane is seen to be hypertrophied, covered with granulations and fungosities, bloodvessels large and tortuous, veins almost varicose, certain points ulcerated, muscular walls greatly thickened, cavity greatly diminished. The patient's pains are increased after exploration.

In urethritis.—General nutrition seldom impaired, and renal disease is rare: constantly more or less urethral discharge, and pain is increased on micturition; the urine is nearly always alkaline, particularly if the case be chronic, eccentric dilatation apt to be developed; results from specific disease or uterine displacements that cause dragging upon the bladder; when the urethra is dilated, papillar hypertrophy, and erosion or ulceration of its walls, are disclosed; polypoid growths are frequent; at the meatus internus there is much thickening of both mucous membrane and submucous tissue; bladder mucous membrane is usually hyperæmic, patient's sufferings are mitigated after exploration, the cavity of the bladder is usually increased.

As to treatment, Dr Pallen goes on to say that in many cases extreme measures are not required. In such as are dependent on malposition of the uterus, lacerated perinæum, pressure of tumours, etc., if the cause can be removed, the affection disappears by simple soothing treatment, carefully washing out the bladder, etc.

Great attention should be given not to confound a cystitis with neurosis of the bladder, that frequently imitates it.

He then goes on to remark as follows:—"However, when cystitis proper is found to exist, there is but one remedy, years of experience, years of patient effort, and years of futile results convince me, save *long-continued and absolute bladder rest* Kolpo-cystotomy, or the formation of an artificial vesico-vaginal fistula, is the only remedy. The disagreeable alternative of one or two years of constant dribbling of urine has never been regretted by any patient on whom I have operated, and I have regretted more than once that I did not operate instead of temporizing with mineral waters, local and constitutional anodynes, and other methods usually prescribed. The quiescence of the bladder, the sweet privilege of sleep, and the mental calm following division of vesico-vaginal septum for cystitis soon improve our patient's condition, and she rapidly rebounds from debility and cachexia to the elasticity and buoyancy of health."

The method adopted, as best on the whole, is to cut through the vagino-vesical septum slowly, layer by layer, with the tip of a Pauquelin's thermo-cautere at *a red heat;* by this means the two great difficulties of dangerous hæmorrhage at the time, and spontaneous closure of the fistula, are best avoided.

DANGER FROM WASHING OUT THE PUERPERAL UTERUS WITH DISINFECTANT SOLUTIONS.—In No. 14, sec. 313, and No. 15, sec. 341, of the *Centralblatt für Gynäkologie* are two contributions by Küstner and Fritsch respectively, drawing attention to the possible risks that may follow from the too free employment of disinfectants in the form of injections into the cavity of the puerperal uterus. The symptoms were those of acute poisoning. In Küstner's case, which subsequently proved fatal, and in which the sectio showed that the introduction of the catheter had in no way injured the uterus, there were suddenly developed unconsciousness, contraction of pupils, rapid respiration (40 per minute), and the pulse ran up to 148, being weak and scarcely perceptible. Clonic spasms seized the arms, the head was thrown backwards, the jaws were clenched, and the small muscles of the face were convulsed, and a clammy sweat covered the patient. In 10 to 15 minutes she improved considerably. In half an hour afterwards the patient vomited black matter, and the urine, removed by catheter an hour afterwards, was perfectly black. The solution used on this oocasion was one of acid to twenty of water. Fritsch records three cases of dangerous symptoms arising from washing out the uterus with disinfectants immediately after delivery. In one of these cases the disinfectant used was salicylic acid, in the other two carbolic acid. In all the cases, sudden collapse, unconsciousness, and extremely rapid pulse were observed. In the cases in which carbolic acid was employed, there followed the characteristic coloration of the urine. All these ultimately recovered. In all three cases the uterus was ill-contracted. Both authors regard those accidents as due to rapid poisoning from the entrance of the disinfectant into the blood through the patulous sinuses of the badly-contracted uterus; and, while strongly in favour of disinfectant irrigation of the puerperal uterus in cases where there is reason to apprehend putrid absorption from the endometrium, recommend strongly that the injection should be performed with the greatest caution, and the avoidance of a forcible stream.

PILOCARPIN IN ECLAMPSIA AND AS AN OXYTOCIC.—*Centralblatt für Gynäkologie*, No. 15.—Dr E. Bidder, St Petersburg, records two cases of eclampsia in which pilocarpin was repeatedly used, giving little relief or any to the convulsions, and producing no uterine contraction. Dr E. Welponer, St Petersburg, also records a case in which the most careful and repeated employment of pilocarpin in large doses failed to induce labour, though it produced the physiological effects of jaborandi.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By WILLIAM CRAIG, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

THE THERAPEUTICAL ACTION OF GELSEMINUM. — Professor Massini, of Basle, has recently published a small pamphlet giving an account of eighty cases of neuralgia of the trigeminus, treated by full doses of the tincture of gelseminum. He prefaces his remarks with a brief description of the physiological action of the drug. Redness of the conjunctiva, pain in the eyelids, contraction of the pupil, double vision and giddiness, are the symptoms which generally follow the administration of moderate doses. When the dose is increased, slight ptosis, dilation of the pupil, gaping, langour, and pain in the limbs are the usual results. The respiration is not affected. In frogs, on the other hand, a large dose produces paralysis of the respiratory muscles, the heart's action remaining unchanged. In cases of neuralgia of the trigeminus, Dr Massini gives twenty minims of the tincture every half-hour up to three doses, and he finds that the first dose usually affords relief, and that the pain rapidly subsides after a second or third dose has been taken. He has never found it necessary to exceed sixty minims, and only in one case did this quantity produce unpleasant head symptoms. The cases in which the remedy produces most benefit are those of simple rheumatic neuralgia of the alveolar branches ot the trigeminus: in these it rarely fails. It also sometimes relieves the pain remaining after the stopping of a carious tooth. Where there is any inflammatory affection of the bone or periosteum no good can be expected from the remedy. The medicine may, if necessary, be repeated several days in succession, the active principle rapidly passing off by the kidneys.—*Medical Examiner*, August 1878.

CHLORIDE OF AMMONIUM IN THE TREATMENT OF HEPATIC DISEASE.—In a communication to the *Philadelphia Medical Times*, Dr William Stewart calls the attention of the profession to the value of chloride of ammonium in the treatment of hepatic congestion and tropical hepatitis. In this country the chloride of ammonium has not obtained the reputation it apparently deserves as a therapeutic agent, and consequently it is rarely prescribed internally either in disease of the liver or any other disease. The dose necessary for its full therapeutic effect is xx. gr., and the only condition which contra-indicates its use in hepatitis is a hot and dry skin. Under such circumstances its use should not be commenced till the skin is rendered moist and perspirable by the administration of some simple diaphoretic mixture. Soon after taking the medicine there is a sensation of warmth in the epigastrium, which gradually extends to the abdomen and over the entire cutaneous surface. The patient feels "light-headed," the pain in right hypochondrium is greatly alleviated, and a free and equable perspiration takes place and lasts for one or two hours. With the next dose similar effects will be observed, and with each succeeding one the interval will gradually become longer, till at length the relief becomes complete and constant. Moreover, after several doses of the medicine, the urine is much increased in quantity, is limpid, and passed without uneasiness, and after a few days the appetite is much improved. Dr Stewart also mentions several anomalous symptoms produced by the drug, which are peculiar and directly referable to the liver, such as a "shock," or as if "something gave way" in the side, or a feeling of "pulling," "pricking," "gnawing," etc. In primary acute hepatitis the chloride of ammonium treatment may be preceded by a mild purgative, diaphoretics, fomentations or poultices to the side, and in some cases a few leeches to the side. In congestion of the liver, in chronic hepatitis, and in "torpor of the liver," Dr Stewart speaks from a large experience of the great efficacy of this medicine, and several cases which he has fully reported appear to bear out the good opinion he has of the drug in the treatment of hepatic disease.—*The Medical Press and Circular*, 17th July 1878.

QUINETUM—A SUBSTITUTE FOR QUININE. — Dr Vinkhuysen, one of the physicians to the King of the Netherlands, has recently instituted a practical inquiry into the actions and uses of quinetum, several physicians throughout Holland having co-operated with him by prescribing it in cases where the salts of quinine would otherwise have been employed. The name quinetum was adopted by Dr de Vry, the preparation of commerce consisting of the collective alkaloids obtained from the East India red bark, 3 grains being the physiological equivalent of 4 grains of sulphate of quinine. It appears that the tonic effects of quinine are still more marked in quinetum, and it has the advantage of rarely producing *tinnitus aurium*, as so often occurs to those who take quinine, even in the small doses usual to those who require it, to relieve the feeling of general weakness so much experienced by European residents in tropical and debilitating climates. From observations taken in 100 cases, Dr Vinkhuysen affirms the following conclusions:—1. The only malarious disease in which quinetum cannot be employed in place of quinine is pernicious fever. Quinetum requires more time to act than quinine, and as rapidity of action is absolutely necessary in this disease, quinetum cannot be used in it as a substitute for quinine. 2. In all forms of pure malarial intermittent fever quinetum has the same apyretic effect as quinine, but is less powerful and acts more slowly. It must therefore be given in large doses and at longer intervals before the ague fit than quinine. 3. Quinetum does not produce the unpleasant and even dangerous symptoms of quinine when given during the fit, and may be taken during the rigors without causing any additional unpleasant feeling. 4. Quinetum *never* gives rise to noises in the ear. 5. Persons who are liable to suffer from the effects of quinine, and who, therefore, cannot take it without the greatest discomfort, can take quinetum without this unpleasant consequence and yet obtain a similar therapeutic result. 6. The influence of quinetum in chronic cases is greater than that of quinine. 7. The tonic action of quinetum is similar and perhaps even greater than that of quinine. 8. The action of quinetum in cases of masked or larval malaria, and especially in rheumatic affections due to malarious influences, is incomparably greater than that of quinine.

PILOCARPINE IN CHILDREN'S DISEASES.—Professor Demme, of Berne, has recently given an extended trial to pilocarpine in various dropsical affections of children. The cases treated were thirty-three in number, and the remedy was administered subcutaneously. Eighteen were cases of desquamative nephritis with dropsy after scarlet fever; in three, the same affection after diphtheria. In the remaining twelve cases the dropsy was due to valvular affections of the heart, rheumatism, acute lung affections, etc. The age of the patients varied from nine months to twelve years; the dose varied from 5 milligrammes to 2 centigrammes. In some of the cases from 2 to 4 injections of a centigramme each were made in the twenty-four hours. Only in two cases were there any unpleasant symptoms, such as vomiting, hiccough, paleness of face, prostration, convulsions. In these cases the peculiar effects of the remedy were not observed. Professor Demme regards pilocarpine as an excellent diaphoretic and sialogogue. The former effect is more marked in older children, the latter in younger patients. Three to seven minutes usually suffice for the effect of the drug to be produced; this goes on increasing for fifteen minutes, and remains at its height for half an hour or more, and then gradually subsides. There is slight diminution of temperature. The pulse is increased in volume and in frequency by from twenty to sixty beats. As a result of the full effect of the pilocarpine there is a loss of weight, varying from 120 to 675 grammes. Diuresis is only occasionally observed. There was watery diarrhoea in two cases. Professor Demme thus summarizes his experiences of the remedy:—1. Pilocarpine is an efficacious diaphoretic and sialogogue in the treatment of certain diseases of children. 2. In appropriate doses it is well borne by the youngest patients. 3. Unpleasant symptoms are of very rare occurrence, and can probably be altogether prevented by administering small doses of brandy before the injection. 4. The cases for which pilocarpine is especially suitable are the parenchymatous inflammations of the kidney with dropsy following scarlatina and diphtheria. In the majority of these cases the flow of urine is decidedly increased, while the quantity of blood and albumen in the urine is diminished rather than augmented. 5. It is uncertain whether pilocarpine has any direct influence upon the action of the heart.—*Medical Examiner*, July 1878.

Part Fifth.

MEDICAL NEWS.

Medicine Chest of Thevenot's Globules. London: H. K. Edge & Co.—A neat and convenient medicine chest has been forwarded to us, containing amongst other things ten different kinds of these globules. They were invented by Mons. C. Thevenot, a French pharmaceutical chemist, and have been approved by the French Academy of Medicine.

Most of the medicines of the Pharmacopoeia may be obtained in these globules and at a moderate price. For many years various chemists have recognised the principle that certain medicines, especially those nauseous in taste or smell, could be best administered within capsules, and, consequently, many such preparations have been manufactured. In Thevenot's globules the case is made of pure vegetable gum and not gelatine, and this is one of the advantages which the inventor claims for these globules. These globules are about the size of large pills, flexible and easily swallowed. The taste of the capsule is sweet and rather pleasant, and for the administration of those medicines which are best administered in the form of capsule, are to be preferred to any other capsules with which we are acquainted.

The inventor evidently considers that this mode should supersede all others in the administration of medicines. There are certain objections, however, to this plan ever becoming universal for all classes of medicinal agents.

1. Many people could not swallow these globules without chewing them, just as there are individuals who cannot swallow pills; thus defeating the very object that this method was meant to secure.

2. It is very obvious that they cannot be administered to children.

3. Many substances require to be administered in doses too large to be given in these globules. Take the case of one of the ten sent us, iodide of potassium. Each globule contains 3 grains, but every physician knows that it is now given in some diseases in very large doses—20 to 30 grains. We fear patients would object to swallow from 7 to 10 of these globules for one dose.

4. Many medicines are best administered largely diluted, which of course could not be obtained by the use of these globules alone. This last objection, however, might to a certain extent be obviated by taking large quantities of the diluting agent previously to the globule.

5. The name is somewhat unfortunate, inasmuch as the word *globule* has got very much identified with Homœopathy, and may thus to a certain extent prejudice the minds of the profession against these globules.

Notwithstanding these objections, this method has much to recommend it. Most substances that are administered in pill could be better given in the form of these globules—so too with those medicines which on account of their nauseousness are now recommended to be given in capsules.

We believe that when these globules become better known, they will be largely taken advantage of by physicians for the administration of those medicines for which they are specially suitable.

The same chemists have also forwarded to us samples of several plasters manufactured by Seabury & Johnson, pharmaceutical chemists, London and New York. These plasters are prepared in a manner which must commend them very highly to the members of the medical profession. We would specially note capsicum plaster, which has now become a most valuable rubefacient; camphorated blister plaster, a very excellent blister. By a strange mistake the manufacturers give the Latin name with two mistakes, *Emplastrum Cantharis cum Camphoræ*, instead of *Emplastrum* Cantharidis *cum* Camphora. In conclusion, we cannot too highly recommend their "Salicylated Surgeon's Isinglass Plaster," a preparation meant to supersede the ordinary adhesive plaster. It is in every respect much to be preferred to the ordinary adhesive plaster.

In the *Philadelphia Medical Times*, Dr J. C. Morris, in writing "On the Use of Alcohol in the Treatment of Disease," gives the result of his experience in hospital practice in regard to the employment of other stimulants in the place of alcohol. He experimented with capsicum, turpentine, carbonate of ammonia, aromatic spirits of ammonia, and musk. He concludes that "they are useful as adjuvants, but cannot take the place of alcohol." Dr Morris recommends alcohol strongly in cases of typhoid fever. His experience seems to point at the administration or non-administration of stimulants having a very material effect on the final issue of the fever. The rules he gives are:—1. Small frequent doses; 2. Along with food if possible; 3. To be withdrawn gradually and completely. On the last head he dwells strongly on the responsibility lying on the physician. He says that patients readily consent to the third rule.

In the *American Practitioner* for March there is a paper by Dr Yandell, the editor, "On the Place of Alcohol in Therapeutics." He refers principally to the points which he believes to have been settled with regard to the physiological action of alcohol, *e.g.*, its action in lowering temperature, diminishing excretion. Like Dr Morris, he recommends its employment in fevers, especially typhoid. He employs it also in phthisis, septicæmia, and D. T. (?) He disapproves strongly of the employment of alcohol in most chronic diseases. He then goes into the subject of the popular faith in the prophylactic power of alcohol, showing from statistics that, among persons otherwise similarly situated, those who partook of stimulants were more liable to disease than those who abstained. Dr Yandell then refers to the responsibility resting on medical men in prescribing stimulants to their patients. He quotes the words of the late Professor Miller of this city:—"Any other than its most guarded and anxious employment is both unscientific and unsafe."

CHRYSOPHANIC ACID IN VON HEBRA'S CLINIC AT VIENNA.—Dr A. Zanisch (Von Hebra's clinical assistant) records, in a paper in the *Wiener Medizinische Blatter*, No. 7, 1878, some investigations recently carried out by him under Hebra's direction. He confirms the original researches of Mr Balmanno Squire, of London, as to the efficacy of an ointment of the acid in psoriasis, and in some other diseases of the skin. He prefers an ointment of 20 per cent. to one of 5 per cent. of the acid, and explains that the proper scientific name of chrysophanic acid is bioxymethylanthrachinon, the acid being a derivative of a hydro-carbon, the name of which is methylanthracen, and its formula $C_{15}H_{12}$. From this hydro-carbon chrysophanic acid is derived by the substitution of two atoms of oxygen for two of hydrogen, and by the substitution of two atoms of hydroxyl (H O) for two other of atoms of hydrogen, so that the rational chemical formula of bioxymethylanthrachinon (or chrysophanic acid) stands thus:—

$$C_{14}\,H_5\begin{cases} C\,H_3 \\ O_2 \\ O\,H_2. \end{cases}$$

He goes on to explain that the colouring matter of the madder-root (alizarin), which is now prepared artificially, is bioxyanthrachinon, a substance nearly allied to chrysophanic acid, inasmuch as the chemical composition of the two substances is identical, with the difference only of a methyl-equivalent (CH_3). He announces his intention of testing this substance clinically in skin disease on the strength of its chemical analogy to chrysophanic acid. However, in this research he has just been forestalled in the *Edinburgh Medical Journal* for July 1878 by Dr James Adams, of Glasgow, who, similarly struck by the chemical analogy of the two substances, has already tried an ointment of alizarin in psoriasis in two cases with favourable results.

LIST OF CANDIDATES for Commissions as Surgeons in Her Majesty's British Medical Service, who were successful at both the London and Netley Examinations, August 1878.

No.	Names.	Marks.	No.	Names.	Marks.
1.	Landon, A. J.	4514	11.	MacNeece, J. G.	3017
2.	Stevenson, J.	4450	12.	O'Connell, M. D.	3010
3.	Lane, W. L.	3750	13.	Noad, H. J.	3005
4.	Feltham, W. P.	3598	14.	Young, A. S. W.	2965
5.	Ritchie, J. L.	3595	15.	Harding, A.	2957
6.	Leah, W.	3546	16.	Falvey, J. J.	2945
7.	Dempsey, P. J.	3512	17.	Dowman, J. F.	2930
8.	Wallis, K. S.	3445	18.	Cross, H. R. O.	2887
9.	Flanagan, J. W. H.	3402	19.	Seymour, C.	2877
10.	Lloyd, O. E. P.	3331			

LIST OF CANDIDATES for Commissions as Surgeons in Her Majesty's Indian Medical Service who were successful at both the London and Netley Examinations, August 1878.

No.	Names.	Marks.	No.	Names.	Marks.
1.	Mullen, J. J.	5811	14.	Nixon, G. M.	4053
2.	Cretin, E.	5408	15.	Warliker, D. P.	3971
3.	Duncan, A.	5003	16.	Worgan, T. E.	3877
4.	Pope, T. H.	4776	17.	Moran, J. J.	3782
5.	Nicholson, G. F.	4610	18.	Smith, F. C.	3767
6.	Hemsted, A.	4576	19.	Monks, C.	3753
7.	Cones, G. A.	4545	20.	Damania, P. J.	3718
8.	Bigger, S. F.	4345	21.	Bull, G. H.	3700
9.	Gomes, D. A.	4319	22.	Quayle, W. A.	3695
10.	Pemberton, R.	4315	23.	Earle, J. H.	3525
11.	Robertson, G. S.	4315	24.	MacCartie, F. F.	3485
12.	Biale, J. S.	4273	25.	Carruthers, C. U.	3480
13.	Walsh, J. E.	4144	26.	Armstrong, H.	3225

PUBLICATIONS RECEIVED.

JOHN CHARLES BUCKNILL, M.D.,—Habitual Drunkenness and Insane Drunkards. London, 1878.

C. B. FOX, M.D.,—Sanitary Examinations of Water, Air, and Food. London, 1878.

Guy's Hospital Reports. London, 1878.

A. M'LANE HAMILTON, M.D.,—Nervous Diseases. London, 1878.

CHARLES HUNTER,—Mechanical Dentistry. London, 1878.

A. LEBLOND, M.D.,—Traité Élémentaire de Chirurgie Gynécologique. Paris, 1878.

R. LIEBRIECH,—School Life in its Influence on Sight and Figure London, 1878.

THOMAS J. MAYS, M.D.,—On the Therapeutic Forces. Philadelphia, 1878.

RICHARD METCALFE,—Testimonials to the Efficacy of Hydropathy in the Cure of Disease. London, 1878.

JAMES SIMSON, — Appendix to Contributions to Natural History, etc. New York, 1878.

Twentieth Annual Report of the Registrar-General of Births, Deaths, and Marriages in Scotland.

Ziemssen's Cyclopædia of the Practice of Medicine. London, 1878.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*A Case of Poisoning by Chloral Hydrate; introducing a New Test.* By FRANCIS OGSTON, Jun., M.D.

THE appearance of an article in the October (1877) number of Eulenberg's *Vierteljahrsschrift für Gerichtliche Medicin,* by Professor Falck, of Marburg, entitled "Toxicologische Studien über das Chloral Hydrat," recalled to my memory a half-written paper on the same subject which I had begun in the spring of that year; and as the appearances noticed by me at the post-mortem examination of a man who had taken a fatal dose of that poison agree in the main with those found by him in rabbits, cats, and dogs, it may be useful to publish the case, especially as it will serve me for an introduction to a new test for this drug which I found out some years ago, and proved in this case.

I commence, then, with the history, so far as known, of the poisoning; giving the post-mortem appearances; relating the tests I employed to prove the presence of chloral in the body; and concluding with a notice at length of the proposed test.

I.—HISTORY OF THE POISONING.

A farmer, in the neighbourhood of Aberdeen, had been in the practice of taking chloral hydrate, partly under medical advice, but to a greater extent unknown to his medical adviser, and had always a quantity of it by him, generally carrying a bottle in his pocket. One evening he went out to look after his cattle, but as he did not return that night, a search was made for him, and after some time he was found lying dead at the foot of a wall. The circumstances of his death, and some slight bruises about his hands and legs, led to an investigation by the law authorities, and I was asked to go and examine the body along with the doctor of the neighbouring village (Dr Reid, of Ellon).

II.—POST-MORTEM EXAMINATION.

The appearances found at the inspection, made on the 1st of August 1876, about thirty-six hours after death, were as follows:—

Externally.—The joints rigid; the pupils of the eye normal in size; the face, front of neck, top of chest, and back parts purple. Several excoriations, with effusion of clotted blood on the backs of both hands, and on the left leg and foot. Well-marked gooseskin on the outer sides of the thighs. The penis retracted.

Internally.—The scalp congested; the cerebral sinuses filled with clotted blood; the bloodvessels on the surface of the brain full of blood; the arachnoid thickened and of a gelatinous appearance; a large quantity of clear watery fluid under the arachnoid and in the ventricles of the brain; the brain apparently somewhat wasted, but otherwise natural, no great amount of bloody spots being noted. Nothing unusual in the mouth, pharynx, and œsophagus, except that the last was thrown into folds, and was somewhat softened; but the parts at the top of the windpipe were œdematous, and the mucous membrane of the windpipe was injected and dark red in colour. The lungs were deeply congested and œdematous. The heart was healthy, but its right cavities contained ten fluid ounces of blood, and its left three fluid ounces, the blood in both cavities being dark, partly fluid and partly in dark firm clots. The gall-bladder was distended with bile. The liver, spleen, and kidneys were much congested, the liver and kidneys being slightly fatty, and the spleen being softened. The urinary bladder was full of urine of a pale colour. Stomach containing a brownish fluid, having a peculiar odour, and solid particles (starchy). The mucous membrane of the great cul de sac of the stomach of an uniform brown-black colour, with several patches the size of a sixpence of bright red punctiform extravasation. The blackening extended in streaks towards the smaller end of the stomach, following the course of the bloodvessels, and the rugæ of the stomach were greatly swollen and œdematous, and of a red colour, which near the larger end of the organ was dark-brown red, and became brighter towards the small end, where it was scarlet-red. Several patches of punctiform ecchymosis were also observed in the middle portion of the stomach. The intestines showed no marked abnormal appearances. The blood throughout the body was of a dark cherry-red colour, giving the muscles a brighter hue than usual.

From these appearances my colleague and I gave it as our opinion that death had been probably caused by one of the narcotico-acrid class of poisons, but stated that a chemical examination was necessary to determine the point with certainty, and that with this in view we had preserved some of the viscera, blood, and urine.

An order to make the necessary analysis was sent me subsequently, and I proceeded to act on it along with my father, Professor Ogston, with the results which shall be described hereafter.

In the meantime I shall recapitulate the points which seem to me characteristic of poisoning by chloral hydrate:—(1.) The bloodvessels of the membranes of the brain were full of blood. (2.) The sinuses contained clotted blood. (3.) The arachnoid was œdematous; and (4.) under it and in the ventricles of the brain clear serum was found in considerable quantity. (5.) The brain substance appeared somewhat shrunken, but no unusual number of bloody points were noted. (6.) The œsophagus was slightly contracted and rugose, and its mucous membrane was softened. (7.) The parts at the top of the larynx were œdematous, and the mucous membrane showed fine injection of its bloodvessels. (8.) The lungs were œdematous, and deeply congested. (9.) The right cavities of the heart were filled with blood (10 fluid ounces), and the left were comparatively empty (3 fluid ounces). (10.) The blood in the heart was partly in firm black clots and partly fluid. Here and throughout the body it became on exposure of a dark cherry-red colour, somewhat darker than that found after death by cold. (11.) The urinary bladder was filled with urine of a pale colour; its walls normal in colour. (12.) The gall-bladder was distended with bile. (13.) The liver was loaded with dark blood. (14.) The kidneys were loaded with dark blood. (15.) The spleen was somewhat soft, and loaded with dark blood. (16.) The stomach showed remarkably the action of the poison, as has been already fully described. (17.) The great and small intestines showed nothing unusual.

These appearances agree pretty closely with those noted by Professor Falck in some of his cases; the only ones which differ from his—and that only in degree—was the appearance of the stomach, which presented traces of strong irritation, almost approaching to corrosion, and the normal condition of the intestines.

In summing up the pathological appearances, I cannot quite agree with Professor Falck, that the appearances were not characteristic, which is what he seems to imply (V.J.S., p. 430); for from the study of his cases, combined with my case, it seems to me that we have clear signs of death by asphyxia; and in addition more or less marked signs, in my case very well marked, of irritation along the digestive tract—signs which place chloral hydrate in the class of poisons known as narcotico-acrids.

III.—Chemical Analysis.

So far I have assumed that the man I refer to had died from poisoning by chloral hydrate, it now remains for me to show what steps I took to prove this, by demonstrating the presence of the poison in the body.

I took two portions of the contents of the stomach.

1. One of these I filtered, and thus obtained a straw-coloured fluid, which I concentrated and divided into two parts, *a* and *b*.

To *a* was added caustic potash, but no reaction followed.

To *b* was then added a few drops of *old* ammonium sulphide, when the straw-coloured liquor was first turned greenish (the colour of the $(NH_4)_2S$, and after a little time it became again straw-coloured, changing slowly to a dark yellowish brown, and letting fall a very slight brownish amorphous precipitate.

2. I then dialysed the second portion of the contents of the

stomach, passed the fluid dialysed through a filter of animal charcoal, obtaining a colourless fluid, which I concentrated from 2 oz. to less than ʒi., and divided into three parts, *a*, *b*, and *c*.

To *a* I added caustic potash, but got no reaction.

b Was still further concentrated to 2♏, when, on adding caustic potash and heating slightly, a very faint odour of chloroform was perceptible to both my father and myself, but no trace of precipitate appeared.

To *c* was added $(NH_4)_2S$, when the same result followed as with portion 1 *b*, only that the colouring was better marked from the reaction taking place in a previously colourless liquid.

I then tried the tests on portions of the blood dialysed and filtered through charcoal, but got no reliable result with either; though the $(NH_4)_2S$ gave some indications of the presence of chloral to me, which, however, my father would not allow to be convincing.

With portions of urine I got no result with either test.

I thus established the fact that the man had taken chloral hydrate, and probably, from my finding it in the stomach, not a very small amount of it; and this, coupled with the appearances in the body, led me to the conclusion that the case was a true case of chloral poisoning.

IV.

I shall now, in conclusion, say a few words on the test for chloral by sulphide of ammonium, which I wish to lay before my medico-legal brethren.

The addition of stale sulphide of ammonium to a solution of chloral hydrate of moderate strength, say 10 gr. to the drachm (the strength of the British syrupus chloralis hydratis), causes, in a short time (*not immediately*), the colourless liquid to assume a slight orange-yellow colour, the liquid remaining clear; on letting it stand, the colour gradually deepens to a brown, and now a cloudiness comes over it, which in about half an hour, or perhaps longer, is deposited as an amorphous precipitate of a brown colour, and which appears to consist of sulphur.

While the change of colour is going on and the brownness appears in place of the orange, a gas is given off of a most offensive smell, apparently a mixture of chloroform and hydrogen sulphide, with something in addition, in such quantity as to fill a large room in a few minutes.

In order to find out the smallest quantity of chloral hydrate which would give a reaction with ammonium sulphide,

(*a*) I dissolved 1 gramme of it in 100 cc. of water, took 1 cc. of the solution and added 1 cc. of ammonium sulphide, when the solution became of a canary yellow colour, passing through orange-yellow to brown in the course of about six hours, letting fall a slight brown precipitate and giving off a characteristic smell.

(*b*) I then took 10 cc. of the above 1 p.c. solution, which I put into 100 cc. of water, and, on adding 1 cc. of ammonium sulphide to 1 cc. of this solution, I got in about half an hour a slight straw colour which had deepened to a pale orange colour in twelve hours, giving off no smell.

(*c*) Lastly, I took 1 cc. of the solution *a*, which I added to 100 cc. of water. Of this solution I took 1 cc., and added 1 cc. of ammonium sulphide, and, after standing for eighteen hours, the liquid had changed to an exceedingly faint straw colour.

Thus 1 cc. of *a* solution (0·01 gramme of chloral hydrate) gave the brown colour, the precipitate, and the smell.

1 cc. of the *b* solution (0·001 gramme) gave an orange colour, but neither precipitate nor smell.

1 cc. of the *c* solution (0·0001 gramme) gave a very faint straw colour.

The first and second of these results are, I think, sufficient to establish the presence of chloral hydrate; the third I should hardly trust to, as the reaction was so faint, though I verified it by repetition of the experiment.

I may further state, that the similarity of the reaction of ammonium sulphide with chloral hydrate to that with antimony salts, suggests a caution in accepting the orange coloration alone as a certain test for either poison. Antimony, on the one hand, may be known by the orange precipitate thrown down by the addition of an acid, which does not follow when it is chloral hydrate which is present; and chloral hydrate, on the other, by the fact that the orange colour deepens on standing to a dull brown.

In conclusion, chloral hydrate alone seems to give this reaction with ammonium sulphide, for I have submitted many of the substances of similar chemical construction to the test without any such result following. Among those were chloroform, chloric ether, formic acid, etc.

ARTICLE II.—*The Physics of the Bladder and Ureters.* By ALEXANDER JAMES, M.D.

WHEN a healthy adult bladder contains urine to the amount of 20 oz., it may be said to be full, and any increase of this quantity must necessarily cause a corresponding distension of the bladder walls. This must in turn cause an increase of pressure in the bladder, and, consequently, in the ureters, *i.e.*, the urine will be secreted under a counter-pressure in the ureters and renal tubules.

For instance, in one of the first bladders which I tested, and which I mention as one which may be considered healthy, I found that with a head of water of 3 feet it rapidly distended till it held 20 oz., after which it took in water so slowly as to be almost imperceptible. I then gradually increased the height to 8 feet when it burst, after having taken in 10 oz. more, in all 30 oz. Thus, then, after 20 oz. a greater pressure would seem to be required to make the bladder hold more.

Now, as an increase of the pressure in the urinary tubules has for its result a gradual diminution in the specific gravity and amount of the secretion, and as, if continued till it amounts to 2·4 in. hg., it will cause complete suppression, we should expect that, in cases where from any cause the bladder is prevented from emptying itself for a considerable period, symptoms would occur showing that the secretion of urine was being checked, or, at any rate, we should expect to find the specific gravity of the secreted urine lowered.

In practice, however, we find that both these suppositions are, as a rule, wrong. Retention of urine almost never leads to suppression, and although I have observed many cases in which complete retention had existed for hours, and in which by catheterism quantities of urine varying from 30 to 50 and 60 oz. have been drawn off at one time, I have never had the slightest reason to believe that there was in these cases any diminution in the specific gravity of the secretion. It is, however, necessary to mention here that the maintenance of a high specific gravity in these cases may be explained by supposing that a certain amount of absorption takes place by the bladder walls. In this way, although the urine sent down by the kidneys might be of low specific gravity owing to counter-pressure, yet, having reached the bladder, an absorption of the watery part would occur, and so the specific gravity of the urine in the bladder be kept high. But when we remember the very large quantities of urine which are removed from previously healthy bladders in cases of retention, we may, I think, conclude that this cannot take place to any great extent.

The physical properties of the bladder during life, therefore, as seen in practice, would seem to be different from those manifested by it after death, as seen by the above experiment, but this difference can be demonstrated perhaps even better in the case of the ureters.

If the pressure necessary to burst one of these be tried, it will be found to amount to about 5 ft. hg., the ureter distending to about ¼ or ⅜ in. in diameter before giving way. Yet cases occur in practice where the ureters are found dilated to ½, ¾, or 1 in. in diameter, this distension having been caused by an internal pressure not exceeding 2·4 in. hg., as one exceeding this would have caused complete suppression of urine. The object of this paper is to endeavour to reconcile this seeming disagreement in physics, and as much as possible by physical means. There are, of course, vital elements to be taken into consideration, viz., the functions of nutrition and growth, and the importance of these is also more obviously seen in the case of the ureters than in that of the bladder. Thus, in hydronephrosis there is, in addition to dilatation, an evidently great increase of the substance of the ureter walls, and we may assume that the same process occurs in the bladder in cases of retention. No doubt only to a comparatively very slight extent, but yet so much that we need not expect by experiment to be able to distend a perfectly normal bladder till it holds 60 oz. of water, nor a ureter till it is 1 in. in diameter, in the same way as we need not expect by simple distension to be able to dilate a non-pregnant uterus till it presents the form and size of one at the full time.

In all these cases, then, the vital functions of nutrition and growth must be considered; but, in this paper, we shall confine ourselves to the discussion of the purely physical causes, and the physical properties of the tissues, which for this purpose we must consider are those manifested by them when subjected to a distending force, viz., cohesion and distensibility.

On these points many experiments have been made. Perhaps the earliest are those of Hales,[1] and as they are of interest in connexion with the subject of this paper, I shall shortly mention some of them. By means of a mercurial manometer he found that the carotid artery of a spaniel dog required a pressure of 5·42 atmospheres (80 lbs. per sq. in.) to burst it.

In a mare he found the carotid so strong that he could not burst it with his apparatus.

The jugular vein of a horse bore a pressure of 148 ft. water (65 lbs. per sq. in.) and did not burst.

Hales also experimented on the tenacity of the periosteum, and noted Musschenbroek's experiments on the strength of silk threads.

He further tried the strength of the walls of the stomach of a dog, finding that it burst with a pressure of 36 in. of water. All his experiments are, however, very elementary, and he has neglected to take into consideration many important physical points.

Among other investigations those of Valentin and Wertheim must be noted. They tested the cohesion of the different tissues of the body, and the following represents the average results:—

Muscles	·06	Tendons	5·3
Arteries	·14	Bone (after Wertheim)	8·0
Veins	·23		
Nerves	·98	Bone (after Bevan)	37·9
Hair	9·9		

More lately Matthews Duncan and Poppel tested the cohesion of the membranes, and from this were enabled to form estimates of the power of labour. Still more lately, Symington has tested the cohesion of the sciatic nerve in connexion with the operation of nerve stretching.

From all these experiments much valuable information has been derived, but in none of them has sufficient consideration been paid to one very important subject, the neglect of which assuredly leads to wrong conclusions, and the proper estimation of which it is the object of this paper to show. The point is one which is of necessity well known to engineers, and to explain it I quote from an essay on the "Strength and Qualities of Wood and Metals," by Professor Macquorn Rankine.[2] Speaking of the cohesion of an iron bar, he says, "If the pull upon a bar be gradually and continually increased a limit is at length reached at which the material ceases to be able to resist the stress, and then the bar is torn asunder. The utmost pull per sq. in. of cross section which a bar of given material sustains just before being torn asunder is called the tenacity, ultimate tenacity, or tearing force of the material, and sometimes the direct cohesion.

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[1] Stephen Hales, *Statical Essays*, London, 1740.

[2] *Cyclopædia of Machine and Hand Tools*, part ii. p. 6.

"The proof tenacity or limit of the pull per sq. in. of section which a bar of a given material can bear without injury is indicated in experimenting especially with ductile materials, either by an increase in the extensibility of the material when a pull exceeding that limit is applied, or by an increase of extension at each time that such pull is reapplied after having been removed,—showing that the stress, though not sufficient to tear the bar asunder at once, would ultimately do so if its application were often enough repeated," or what amounts to the same thing, if its application were long enough continued.

Thus, then, engineers, in estimating the strength of materials, not only know what is the force which will burst a given material at once, but also that there is a smaller force which, if it be continuously or intermittently applied, will in time produce the same effect.

Further, it is manifest that the estimation of the latter force, the *proof tenacity*, is of much more importance than that of the former, the *ultimate tenacity*, for the reason that in testing say a boiler or receiver, we know that the pressure to which in working it will be subjected is one which will be continuously or intermittently applied for weeks, months, or years.

It is also equally evident that in the animal body, in calculating the amount of pressure put into action from the effects produced, the knowledge of the proof tenacity is by far the most important. The pressure in the bloodvessels, gland-ducts, stomach and intestines, uterus in pregnancy and parturition, bladder, etc., are all pressures which are being continuously or intermittently applied for a longer or shorter period of time. The estimation of the proof as distinguished from the ultimate tenacity is, then, for this reason of equally great importance in physiological as in engineering physics; but when we consider the difference in the ratios of the proof to the ultimate tenacity in the different materials, we must conclude that for this further reason the importance, as far as forming correct conclusions is concerned, is far greater in the physiological. This is simply because in the latter the difference between the proof and ultimate tenacity is far greater. The effect of strains, not exceeding and exceeding the proof tenacity, on cohesion and distensibility, can be best understood by the following diagram from Rankine.[1]

Let O represent the position of the right-hand end of a horizontal bar in its free condition, the other end being fixed somewhere to the left of the figure. When a gradually-increasing stretching-load is applied to the bar, let its right-hand end move from O to C,

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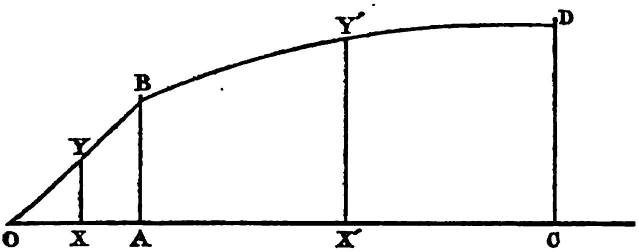
[1] *Cyclopædia*, part ii. p. 8.



so that a scale of distances or *abscissæ*, measured from O towards C, shall represent the successive elongations of the bar. Let *ordinates* at right angles to O C represent, according to a suitable scale, the loads required to produce these elongations, so that X Y represents the load which produces the elongation, O X, X′ Y′ the load which produces the elongation O X′, etc. Let A B be the proof load and X Y a load within the proof load, and let X′ Y′ and C D be loads exceeding the proof load. It will now be noticed that when the load does not exceed the proof load the elongation bears a nearly constant proportion to the load, so that the line from O to B is nearly straight; but when the load exceeds the proof, the elongation increases more rapidly than the load in a continually increasing proportion till the bar is torn asunder; hence from B to D the line presents a curve concave towards the axis of abscissæ or scale of elongations O C. Having now understood what is ultimate tenacity and proof tenacity, and what are the effects of loads exceeding the proof, we must next consider what is the proportion of the proof to the ultimate tenacity. On this point Rankine says: — "The proof tenacity, generally speaking, approaches nearest to the ultimate tenacity in the stiffest and strongest materials." Conversely, we conclude that in the softer and weaker materials the proof tenacity will be proportionally smaller than the ultimate, and as the animal tissues with which we have to deal in this paper come under the latter class of materials, we can readily understand the importance of considering the proof as distinguished from the ultimate tenacity. In fact, it may be said that, speaking in the strict physiological or pathological sense, the knowledge of the ultimate tenacity of any of the tissues is of no importance whatever. In actual treatment it is of the greatest importance; the surgeon should know the ultimate tenacity of the sciatic nerve while he is stretching it for sciatica; the accoucheur should know that of the child's neck when he is engaged with a breech presentation; and in a medico-legal sense it is often an important point, but when we have to deal with forces exercised within the body its importance is almost *nil*.

To obtain data upon which to form conclusions as to the proportion between the proof and ultimate tenacity in animal tissues, I performed the following experiments:—

The tissues tested were the intestines of sheep, and the results obtained show—1*st*, The ultimate tenacity or bursting weight; 2*d*, The length of time which ⅔ of this takes to cause rupture; 3*d*, The length of time which $\frac{7}{12}$ takes; and 4*th*, The time taken by ½. The method employed was to fix equal lengths of intestine (12 in.) to wooden cores, by means of which the various weights could be conveniently applied.

The ultimate tenacities and the various fractions of them, ⅔, $\frac{7}{12}$, and ½, were obtained in the following way:—For each experiment three feet of intestine was taken and divided into three equal portions. By means of a spring weigher, the weights required to burst the two outer portions were obtained, and the average of these two was taken as representing the ultimate tenacity of the middle portion. To the middle portions the various fractions of these weights were applied, and the time which elapsed between the application of the weights and rupture of the gut noted.

The greatest possible care was taken to prevent the pieces drying, and in every case the experiments were made within eighteen hours of the death of the animal.

The results of fifty such experiments are given in the following table:—

TABLE I.—INTESTINE OF SHEEP.

No.	⅔.		$\frac{7}{12}$.		½.			
	Bursting Weight.	Time.	Bursting Weight.	Time.	Bursting Weight.	Time.		
	Ounces.	Minutes.	Ounces.	Minutes.	Ounces.	H.	M.	
1	21	6¾	42	5½	31	3	30	
2	36	10	42	14	26	7	30	
3	42	1	44	10	24			More than 10 hours.
4	36	14	48	16	24	0	20	
5	47	15	52	49	23	1	30	
6	48	5½	55	81	44	7	0	
7	56	20	56	14	45	1	30	
8	48	11	54	8	43			More than 10 hours.
9	40	3	49	55	40	2	35	
10	36	6½	49	100	35	3	0	
11	40	20	44	25				
12	52	½	42	4				
13	52	5	46	23½				
14	48	1½	44	5				
15	54	1½	44	120				
16	60	1	46	25				
17	60	2	54	180				
18	36	¼	54	13				
19	30	8	28	25				
20	30	½	30	13				
Aver. in min.........		6¾ (nearly).		41 (nearly).		202 (nearly).		

This table shows some very interesting points: *First,* The great variations in the amounts of the bursting weight in different portions of intestines, the extremes being 20 oz. and 60 oz. The strength of the gut seems to be owing to the peritoneal coat and not to the muscular, and I came to this conclusion from observing the manner of breaking, and also from having in other experiments weighed the portions before testing them. As the weight depends upon the muscular coat rather than on the serous, if the strength of the gut were due to the former the heaviest portions would always be the strongest. By experiment, however, I found that although this was for the most part the case, yet the results were not such as to enable me to calculate from the weight alone what the tenacity should be. In all cases further I found that the upper and middle portions of the intestine were stronger than the lower.

Secondly, The lengths of time which the different fractions of the bursting weights take to cause rupture. These also vary considerably, with $\frac{2}{3}$ from 15 sec. to 20 min., and with $\frac{7}{10}$ from 4 min. to 180 min. With $\frac{1}{2}$ the shortest time was 20 min., and the longest of the eight which burst was 7 hours. The other two did not burst within 10 hours, but by that time both of them had almost given way; and had I been able to completely prevent drying taking place for an hour or two longer I am sure that rupture would have occurred.

The cause of these great variations is not very clear, but they are probably in great part due to the estimate of the bursting weights being so uncertain.

The average lengths of time are—

For $\frac{2}{3}$ bursting weight nearly $6\frac{3}{4}$ minutes.
„ $\frac{7}{10}$ „ „ 41 „
„ $\frac{1}{2}$ „ „ 202 „

But does half the bursting weight represent the proof tenacity of the intestine? We may, I think, conclude that it does not. One half will cause rupture in say four hours, but less would probably have the same effect if a longer time were given. To determine what is the proof tenacity further experiments are necessary; but from these few which I have tried we can, I think, obtain some interesting information as regards the physics of the bladder, ureters, and other tissues.

In order, however, to understand these, we must bear in mind another important consideration. This is, that in the case of the bladder, ureters, etc., the force tending to their rupture is exercised against all points of the inner surface of their walls; and, consequently, the greater the extent of this surface the greater will be the amount of force to which it is subjected, and the less will be the power of the walls to resist a force tending to their distension or rupture. In practice, the strength is measured by the radius or diameter—if this be doubled the strength will be halved. Thus, with equal strength of walls, a hollow sphere, the superficial extent of the inner surface of which is 25 sq. in., and the diameter of which is 2·8 in., will be able to resist twice the internal pressure which can be borne by one having an internal superficial area of 100 sq. in. and a diameter of 5·6 in.

Similarly any hollow organ, as a bladder, ureter, uterus, stomach, etc., will oppose a greater resistance to distension or rupture when the contained distending fluid is small in amount than when it is large.

For example, let us take three bladders A, B, and C, containing 20 oz., 40 oz., and 60 oz. respectively. Supposing that they are all equally spherical, the diameter of A will be 4·04 in.; of B, 5·19 in.; and of C, 5·83 in. Thus, B will be ¼ and C ½ weaker than A; or, in other words, if A can just stand a pressure of 15 lbs. per sq. in., B will only be able to stand about 12 lbs. and C only about 10 lbs. per sq. in. This is assuming that in A, B, and C the walls are equally strong and able to resist a distending force, which is, however, not the case in the animal body. On the contrary, as the diagram shows, we may conclude that the more stretched the walls of a bladder become the less will they be able to resist a further stretching, and so as a bladder becomes more and more distended it loses strength, not only by becoming larger, but also by its walls becoming intrinsically weaker. Thus, then, in studying the physics of such a structure as the bladder, we must always bear in mind two physical facts, *first*, that it is the proof and not the ultimate tenacity with which we have to deal; *second*, that as such structures are becoming distended they are losing strength, from their increase in size and also from their walls becoming weaker.

Further, we must always bear in mind the dependence which the tenacity has upon time. A comparatively slight pressure acting for a long time will have the same effect as a greater pressure acting for a short time.

(*To be continued.*)

ARTICLE III.—*Displacement of the Bladder and Peritoneum in the Male by Distention of the Rectum.* Investigated by J. G. GARSON, M.D., L.R.C.S. Ed., when under Professor BRAUNE, in the Anatomical Institute, Leipzig.

IN 1865 Simon, of Heidelberg, first introduced his hand into the rectum to complete an operation for fistula. The facility with which he was able to introduce his whole hand, measuring 21 cm. in its greatest circumference, while the patient was under the influence of an anæsthetic, induced him to make some farther experiments on rectal palpation as a means of diagnosis and treatment. Expectations that this mode would yield very important results were freely indulged in, and the advantages to accrue from it were often much exaggerated.

Simon,[1] in his description of the operation, says that there appeared dangers which prevented him from introducing his hand higher up the rectum than the ampulla. Nevertheless, with the body of his hand in that cavity, the upper boundary of which is on a level with the third sacral vertebra, he was able to explore with the extended fingers the umbilical region. More recently, however,[2] Nussbaum, of Munich, has introduced his whole hand and arm up to the elbow into the rectum, and has succeeded in reaching the ensiform cartilage.

The dangers to be feared are rupture of bloodvessels, injuries to the sphincter, injuries to the peritoneum, etc. The risk from rupture of the bloodvessels is much less than one would have expected, as has been shown from actual results. Injuries of the sphincter are also not of very material importance, and might be entirely avoided by dividing it with a bistoury previously, as we know that after that operation it heals rapidly, and generally without bad consequences. What is most to be dreaded is injury of the peritoneum, as it is of the gravest importance. The cases on record where that has happened are few in number, but we are inclined to believe that they are more numerous than is generally supposed, because fatal cases are not so frequently published as successful ones, and it is only through private information that one hears of cases which have terminated fatally both after this and many other operations. At all events Simon's rectal palpation has considerably fallen in the reputation of surgeons, and the cause thereof is to be found in the serious consequences which have frequently resulted. However, the object of this paper is not to consider the dangers of that operation, but to direct attention to the displacements of the pelvic organs produced during the operation, and more especially to that of the bladder, urethra, and peritoneum.

The following was the course pursued in investigating these points:—The rectum of the body of a well-developed middle-aged man was emptied by injecting water; then a collapsed indiarubber bag of oval shape, and with a tube attached to one end, was introduced. This was easily done without injury to the sphincter. The indiarubber bag was then distended by injecting water through the tube till it was the size of the maximum circumference of our hand—25 cm. To make it this size 300 grammes of water were required. The rectum, therefore, was in the same condition as if the hand had been in it. The tube was now closed, so that no water could escape. A very flexible caoutchouc catheter No. 11 was then introduced into the bladder, and 240 grammes of water were injected through it to distend that viscus, and the catheter closed, so that no water could escape. The object of introducing a flexible catheter into the bladder was to get the urethra distended throughout its whole course, and at the same time not to displace it, so that when we came to make a section of the parts we would also have a section of the urethra. The body was then laid upon its back in a dry zinc trough, outside of which was placed a freezing mixture of salt and ice. After it was frozen, which took about sixty hours, it was sawn through as nearly as possible in the middle line. The preparation was then cleaned of the sawdust, etc., by washing it in ice-cold water, and afterwards placed in absolute alcohol while still in a frozen condition. Here it was kept till perfectly hardened without any perceivable displacement of parts taking place during the process. Fig. 1 is an exact representation of the section. If we examine it we find at the lower part of the large distended ampulla the sphincter in an almost normal condition, notwithstanding that it had been previously dilated to allow of the introduction of the indiarubber bag. On the walls may be seen the ramifications of the bloodvessels, which, although not previously injected, are well marked from the stretching and thinning that the walls have undergone. On the right and above is a narrow opening into the first and upper division of the rectum, which in front is almost on the same level as the pouch of Douglas, and behind on a level with the interarticular cartilage of the first and second sacral vertebræ. The diameter of the distended rectum is about 8 cm., which, estimating roughly, gives a circumference of 24 cm. This corresponds accurately to the size of the circumference to which the indiarubber bag was distended. The displacements of the bladder, urethra, and peritoneum are worthy of observation. The penis and perineum, it will be seen, are not displaced, but the bladder is entirely raised up out of the pelvic cavity, and along with it the peritoneum also both in front and behind, so that the bladder is found to be in the same position as it is in the new-born child. Its shape is irregularly round. The internal orifice of the urethra is situated 15 mm. below the line of the conjugata vera, and 30 mm. behind the symphyses—that is, measuring from the orifice forwards to a vertical line passing through the middle of the symphyses, the point of reflexion of the peritoneum from the abdominal walls on to the bladder is considerably raised, being 40 mm. above the upper border of the symphyses. Douglas's pouch is also considerably raised, being only 22 mm. below the line of the conjugata vera. The length of the membranous and prostatic portions of the urethra together is 75 mm., the length of the membranous portion being 25 mm., and that of the prostatic portion 50 mm. The prostate itself is much larger than in the normal condition, and at the same time much diminished in thickness, its greatest thickness, which is behind the urethra, being 9 mm. It is this stretching of the urethra and prostate which allows the bladder to be raised. The urethra is deficient about the middle of the penis, which is owing to its not being perfectly straight when frozen, consequently the section is not through the whole length of the canal, but to one side at a part of it. Cowper's gland is well marked, as is also the vena dorsalis penis, which, when the section was made, was found to be full of coagulated blood. With the exception of a small calcified abscess, about the size of a cherry-stone, situated in the cavernous portion near the bulb, there is nothing farther to be noted in this preparation.

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[1] Langenbeck's *Arch. für Klinische Chirurgie*, bd. vii. p. 119; and *Deutsche Klinik*, No. 46, Sept. 1872.

[2] *Deutsche Zeitschrift für Chirurgie*, bd. 1, s. 89.

In a second body, that of a man, the rectum was distended in the same manner by the introduction of an indiarubber bag, only it was not so much distended as in the previous case. A catheter was introduced into the bladder, but this time a metal one was used. The body was then frozen, and afterwards sawn vertically as near as possible to the mesial plane. The section was then treated in the same manner as before. In this preparation the internal orifice of the urethra is 35 mm. below the line of the conjugata vera, and 37 mm. behind the symphyses. The peritoneum is also displaced upwards, being 55 mm. above the symphyses, whilst the pouch of Douglas is 38 mm. below the conjugata vera. The length of the membranous portion of the urethra is 15 mm., that of the prostatic portion 35 mm., and the diameter of the prostate behind the urethra is about 8 mm. These measurements are less than in the previous preparation, but it must be remembered that the rectum and bladder were not so fully distended. In this case the measurements are not so accurate as in the first, because the section was not so good, the body not being sufficiently frozen when it was cut, and because we did not ascertain what quantity of water was injected into the indiarubber bag, and consequently do not know its exact size. This was the first body we experimented upon. However, in both sections it was evident that the bladder was considerably elevated in its position.

To check those results we deemed it advisable to make some more experiments on a fresh unfrozen body, which was that of a muscular, well-developed, middle-aged man. The intestines were removed as far as the sigmoid flexure of the colon. A string was tightly stretched between, and secured to, the anterior superior spines of the ilii. Measuring from this line, we found the depth of the pouch of Douglas to be 15·5 cm. when the rectum and bladder were empty. The bladder was then filled with 200 grammes of water, and the depth of the pouch was now found to be 13·5 cm. After the indiarubber bag was introduced into the rectum and distended with 300 grammes of water, the depth was only 10 cm. The water injected into the bladder was then drawn off, and the depth of the pouch measured, while the rectum only was distended, and found to be 10 cm., so that the evacuation of the bladder caused no alteration in the depth of the pouch.

To show that distending the rectum alone elevates the bladder even when empty, along with the peritoneum, and that the height of the bladder corresponds to the degree of distention of the rectum, the following observations were made on the same subject: The indiarubber bag was introduced into the rectum, and filled with 120 grammes of water. The depth of the pouch of Douglas was then measured, and found to be 14·2 cm. instead of 15·5 cm., which it was when both bladder and rectum were empty. After 180 grammes more water had been injected into the bag the depth of the pouch was only 10 cm. Therefore, we may say that the depth of the pouch of Douglas depends upon the degree of distention of the rectum, and that by distending the rectum we are able to alter materially the distance of the peritoneum from the anal aperture. In the normal rectum, as may be seen in Fig 2, which is a drawing taken from a preparation made in the same manner as ours by Professor Braune, only under normal conditions, the distance of the peritoneum from the anus is from 7 to 8 cm., but in our two cases the distance is 10 and 12·5 cm. respectively, and Dr Cahen, of New York, has, in a work which will shortly appear, given a long list of measurements which still more clearly illustrate this displacement. On dried preparations, also, it can be seen very well that the peritoneum becomes displaced according to the extent to which the rectum is distended. Of course, measurements on such preparations are not strictly accurate, and must not be taken approximately. On one of our preparations, in which the rectum was small and contracted, the distance of the peritoneum from the anus was 5 cm., and in another, where the rectum had been distended considerably, it was 8 cm.

On another body—that of a well-developed middle-aged man—we made some further observations on the distance of the peritoneum from the symphyses when the rectum and bladder are distended. Having introduced the indiarubber bag into the rectum, we distended it with 300 grammes of water. We then injected about 200 grammes into the bladder, and made an incision 7 cm. long in the mesial line, and divided the structures down to the bladder, which projected considerably above the pelvic cavity. Upon examining the wound cautiously, we found that the peritoneum was entirely above our incision. However, in order to avoid any displacement of it upwards, we made another incision immediately below the umbilicus into the abdominal cavity, through which we introduced our finger, and examined the position of the peritoneum, which we found to be 6 cm. above the upper border of the symphyses. On emptying the rectum, by allowing the water to escape from the indiarubber bag, the bladder was seen to sink behind the symphyses, and when the rectum was emptied there was only 2·5 cm. of it projecting above the symphyses uncovered by peritoneum.

The ampulla of the rectum is bounded above by a circular band of fibres called the sphincter tertius by Nélaton, which, although not of so much importance as many have imagined, is useful as marking the junction of that cavity with the upper part of the rectum, and as a guide to the spot where the peritoneum leaves the rectum to be reflected on to the bladder. The muscle is arched over by the longitudinal fibres, which, from being shorter on one aspect, generally in front, cause flexure of the gut and a folding of the muscle upon itself, so that a valvular projection into the intestine is formed. This folding of the muscle remains even after the rectum has been removed from the body. The name sphincter tertius is not very appropriate, as there are several other similar bands, varying in number according to the development of the circular fibres of the gut in different subjects, which might equally well be called sphincter quartus, quintus, and sextus.

As a relation of parts similar to those found in our preparations occurs in the living body, although perhaps not to such an extent, from different degrees of filling of the rectum and bladder, we add, in the following table, a series of measurements taken from preparations in this Institute, and from drawings in Pirogoff's Atlas, to show the position of the peritoneum and internal orifice of the urethra in various conditions of the bladder and rectum.

In conclusion, we hope that we have been able to demonstrate the following points:—

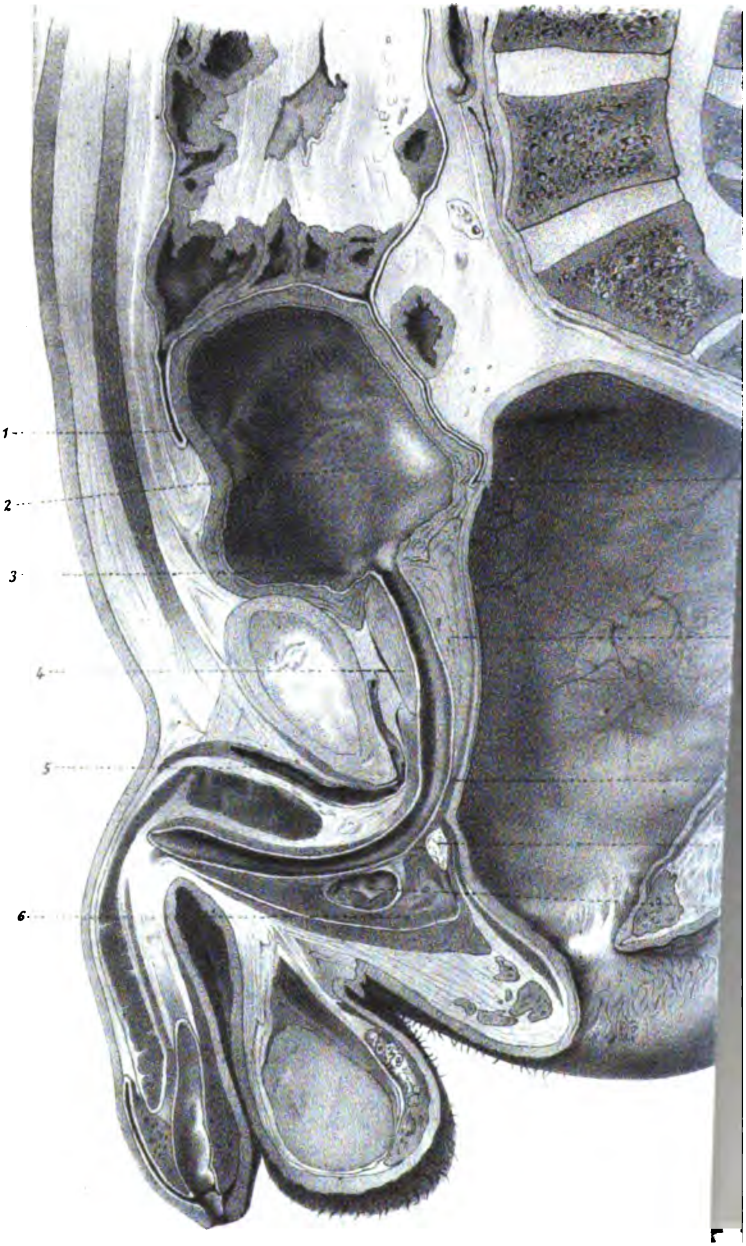
1st, That the distance of the internal orifice of the urethra behind the symphyses remains pretty equal whether the displacement of the bladder is great or small, as the extreme distance in our table is 37 mm., and the smallest is 23 mm. The displacement of the bladder produced by distention of the rectum evidently takes place in a plane which is parallel to that of the symphyses.

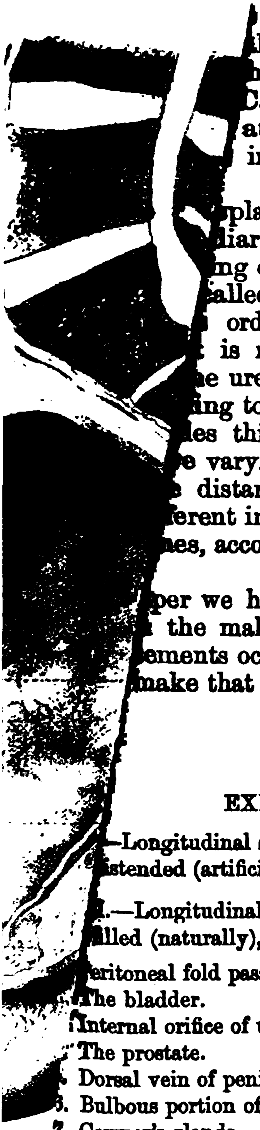
2d, That the distance of the internal orifice of the urethra from the level of the conjugata vera is very variable. In Case No. I., where the rectum was very much distended, the bladder was highest, the distance of the internal orifice of the urethra from the level of the conjugata vera being 15 mm. In Case No. VII. it was lowest, being 72 mm. below the conjugata vera, and in this case the rectum was empty.

3d, That the raising of the peritoneum above the symphyses can also be produced by simple distention of the rectum. Usually, when the rectum is empty, the peritoneum is only a few millimetres above the symphyses, as in Cases Nos. IV. and V.; but in Cases Nos. I. and II., it was 40 and 55 mm. where the rectum was distended. In Case No. IX., however, where the rectum was empty and the bladder much distended, the distance was 70 mm. Hence it is evident that in performing the suprapubic operation for lithotomy or puncture of the bladder that viscus can be as easily raised above the symphyses by distending the rectum as by injecting the bladder, and that in cases where it is not advisable to

No. of Case.	Condition of the Bladder.	Condition of the Rectum.	Distance of the internal orifice of the urethra from the line of the conjugata vera.	Distance of the internal orifice of the urethra behind the symphyses.	Distance of the peritoneum above the symphyses.	Depth of the pouch of Douglas from the level of the conjugata vera.	Remarks.
			mm.	mm.	mm.	mm.	
1	Much distended (240 gram. of water).	Much distended filled with 300 gram.	15	30	40	22	Cases described. Longitudinal sections. Rectum distended with indiarubber bag. Subject, a middle-aged man.
2	Fully distended.	Fully distended.	35	37	55	38	Frozen sections.
3	Much distended.	Moderately distended.	54	34	50	54	Pirogoff's Atlas, Fas. III. A., pl. 19, fig. 2. Subject, a muscular man.
Cases where the Bladder and Rectum were Empty.							
4	Almost empty.	Absolutely empty and contracted.	54	32	5	65	Braune's preparation in the Anat. Institute. Subject, a muscular man.
5	Absolutely empty.	Almost empty.	50	27	0	84	Young man, æt. 17. Pirogoff's Atlas, Fas. III. A., pl. 16, fig. 2.
Cases with Empty Rectum and Distended Bladder.							
6	Much distended.	Absolutely empty and contracted.	60	25	40	84	Pirogoff's Atlas, Fas. III. A., pl. 19, fig. 3. Subject, a muscular man.
7	Much distended.	Empty and Contracted.	72	32	Not marked.	Not marked.	Pirogoff's Atlas, Fas. III. A., pl. 20, fig. 2. Muscular man.
8	Distended.	Empty and Contracted.	55	35	55	58	Pirogoff's Atlas, Fas. III. A., pl. 20, fig. 3. Frozen in the lithotomy position.
9	Distended.	Empty and Contracted.	57	26	70	77	Pirogoff's Atlas, Fas. III. A., pl. 20, fig. 1. Muscular man.
10	Half filled.	Empty.	57	28	2	71	Pirogoff's Atlas, Fas. I. A., pl. 12. Muscular man. Frozen in the erect position.
Cases with Moderately Distended Bladder and Rectum.							
11	Moderately full.	Moderately full.	56	25	8	78	Braune's preparation in the Anat. Inst. Arteries and veins injected. Middle-aged man. Frozen Section.
12	Half full.	Half full.	46	31	20	46	Braune's Atlas, pl., fig. 1. Muscular man.
13	Moderately full.	Moderately full.	53	30	16	65	Kohlrausch's Anatomy of the Pelvic Organs, pl., alcoholic preparation.

Fig. 1.





a large size, distention of the rectum is all
ke the parts suitable for the operation.
h of Douglas is always raised by distention
Case No. V., where the rectum is absolutely
at a distance of 84 mm. below the level of the
in Case No. I., it is only 22 mm. below that

placements of the bladder by distention of the
iarubber bag are, as may be seen in Fig. 1, not
ng of the perineum, but by the stretching of the
alled fixed parts. The prostate is stretched to
ordinary length, and is also flattened. The
is not quite so much stretched, but is longer
e urethra, therefore, is apt to vary in its length,
ng to the state of the distention the rectum is in.
es this, there are other causes which make its
e vary.

distance of the peritoneum from the anus varies
erent individuals, but also in the same individual
es, according to the greater or less distention of the

per we have only treated of the displacements that
the male; but as it is equally important to know
ements occur in the female under similar conditions,
make that the subject of future investigation.

EXPLANATION OF PLATE.

—Longitudinal section through a frozen body with the rectum much
istended (artificially).

I.—Longitudinal section through a frozen body with the rectum
lled (naturally), but not distended.

eritoneal fold passing over the bladder from the abdominal walls.
he bladder.
Internal orifice of urethra.
The prostate.
Dorsal vein of penis.
. Bulbous portion of urethra.
7. Cowper's glands.
8. The upper end of the membranous portion of the urethra.
9. Peritoneal fold forming Douglas's pouch.
10. Prostate.
11. Abscess in the bulbous portion of urethra.

ARTICLE IV.—*Cases of Intra-Cranial Tumour.* By BYROM BRAMWELL, M.D., Physician and Pathologist to the Newcastle-on-Tyne Infirmary, Joint Lecturer on Clinical Medicine and Pathology in the University of Durham College of Medicine, Newcastle-on-Tyne.

(*Continued from* p. 147.)

CASE III.—*Female, æt.* 19. *Head injury, followed by some hours of unconsciousness, two years before admission. Second fall a year after the first. Probable Syphilis. Constant and severe headache, worse at night. Left-sided Unilateral Convulsions, commencing in the Fingers of the left hand, and preceded by a well-marked Aura. Post-epileptic Aphasia. Speech clear and distinct during the fits. Relieved by Iodide and Bromide of Potassium.*

H. W., æt. 19, a governess, was admitted under my care on 30th March 1876, complaining of headache, difficulty in speaking, and fits.

She stated that she had enjoyed good health until two years before admission, when she got a fright and became nervous and hysterical. In September 1874 she fell on the ice, striking the back of her head. She was unconscious for some hours afterwards. In June 1875 she fell off her horse "in consequence of a giddy feeling in the head." In July 1875 she had a second fall from her horse and rolled down a steep bank, hurting her head severely. In November 1875 she began to suffer from constant and severe headache, and soon afterwards to take fits. After the third convulsion her speech became affected. The headache and fits have continued almost daily until the present time. Her memory and powers of application are so much weakened that she has been obliged to relinquish a good situation in America.

In June 1875 she suffered from sore throat, and soon afterwards some brown spots appeared on her chest.

The Family History is good.

Condition on Admission.—The patient is very intelligent and well educated. Her memory is extremely bad. She complains of severe headache. The pain, which is generally worse at night, is referred to the right side of the head and to the vertex.

The exterior of the skull is normal.

Sensibility of all kinds seems natural.

Hearing, taste, and *smell* are natural. *Sight* seems good, though she says it is slightly impaired. The pupils are equal and moderately contracted. The veins of the fundus are large, but there is no œdema of the disc.

Speech is slow and indistinct, and is attended with great effort and twitching of the facial muscles. The patient often hesitates in the middle of a sentence, and after a great effort gets out what she wants to say. At other times she stops short apparently unable to remember the word she wants. She can repeat the alphabet, but cannot say it herself, nor can she write it correctly. In writing she often makes the same mistakes as in speaking.

Convulsions.—She is seized, four or five times a week, with epileptiform convulsions. The fit is preceded by a well-marked aura: She invariably feels a stinging sensation in the tip of the middle finger of the left hand; this sensation lasts for about three minutes and then passes slowly to the metacarpal joint of the finger; after reaching this point it passes with great rapidity up the ulnar aspect of the forearm to the elbow; she then becomes unconscious and convulsed. The spasm commences in the fingers of the left hand. (I never myself saw the commencement of a fit, and was unable to ascertain the finger first affected.) The muscles of the left arm, left leg, and left side of the face are affected. A few twitchings also occur in the right orbicularis palpebrarum. Sometimes during a fit, and while she is apparently quite unconscious, she talks distinctly and without any hesitation. I myself saw her on one occasion when the fit was fully developed. She was apparently quite unconscious; the conjunctivæ were insensible; tonic and clonic convulsions of the left arm, leg, and side of the face were occurring; and she was talking without any hesitation or difficulty. During this attack, which lasted for three minutes, the facial muscles were only slightly affected.

As a rule the duration of a fit is from ten to twenty minutes. The fit always commences in the same manner, and the spasms are always limited to the left side. After a fit she generally complains of numbness and weakness in the left arm.

She can arrest the fit by tying a ligature tightly round the finger at the commencement of the aura. She does not, however, make a practice of stopping the fit in this way, as it causes her to be "queer and stupid in the head." This sensation lasts until the occurrence of another fit, which soon comes on, and is invariably severe.

The patient is well developed and extremely well nourished The *alimentary, circulatory, respiratory, urinary,* and *integumentary* systems are normal. Menstruation occurred on the day of admission to the hospital. It had not been present for two years previously.

Progress of the Case.—She improved considerably under full doses of iodide and bromide of potassium, and was made an out-patient on 2d May. She continued to attend for several months. When last seen her condition was as follows:—The headache had almost disappeared; the fits occurred much less frequently, one every six or eight weeks; the character of the convulsions had changed, the aura commenced on the inner side of the left thigh, and the spasm first affected the calf of the left leg; speech was very much better, though still far from natural.

Remarks.—This was a typical case of unilateral convulsions. If we accept Ferrier's localization, we may conclude from the facts that the spasm commenced in the fingers of the left hand, and that the upper extremity was chiefly affected, that there was a discharging lesion of the right ascending parietal convolution. That the exciting cause was the presence of a gross syphilitic lesion is, I think, probable from—

1st, The style of the symptoms; severe localized headache, worse at night; repeated unilateral convulsions; and the good condition of patient.

2d, The history of sore throat and rash.

3d, The improvement under iodide of potassium.

4th, The absence of any other apparent cause of limited softening, such as embolism.

The lesion probably consisted of a limited adhesion of the membranes with softening of the subjacent brain tissue. Possibly, too, from the severe character of the headache, there was some affection of the bone or periosteum. The absence of swelling of the discs showed that there was no great increase of the intra-cranial tension.

The chief point of interest in connexion with the case is the remarkable fact that speech, which was very greatly affected during the intervals, was sometimes quite natural during the convulsive paroxysms. I am unable to give any explanation of the circumstance, which seems quite contrary to all experience, and content myself with simply placing it on record. Dr Hughlings-Jackson says—"Elaborate mental states do not occur during an epileptic discharge—as a direct result of the discharge we mean. . . . Except at the onset of epileptic seizures, when there are crude mental states, such as coloured vision, there occur no *psychical states* of any kind during, but only *physical effects from,* the excessive local discharge, whatever the part of the 'organ of mind' may be in which the 'discharging lesion' is situated. . . . No ideas of objects, of words, nor any kind of states of consciousness, occur during the excessive discharges, excepting crude sensations at the outset."[1]

The aura in this case was particularly well marked; and the patient's experience as to the effect of arresting the fit is quite in accord with that of Niemeyer. He says, "On the whole compression of a limb, from which the aura seems to proceed, is not advisable, even although we may avert the fit by so doing, since, in the first place, the patient feels worse after thus repressing an attack than if he had had one; and, in the second place, because his next seizure is apt to be of unusual violence."[2]

The next case is another example of post-epileptic aphasia resulting from intra-cranial syphilis. In it, however, the convulsions were right sided.

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[1] *West Riding Lunatic Asylum Medical Reports,* vol. vi. pp. 276 and 280.

[2] *Text-Book of Practical Medicine,* vol. ii. p. 369.

CASE IV.—*Male, æt. 23. Syphilis Seven Years before Admission to Hospital. Severe Secondary and Tertiary Symptoms. Headache and Epileptiform Convulsions Six Years after the Primary Affection. State on Admission: Intense Headache, worse at Night, and confined to the Left Side of the Head: Periostitis of the Left Temporal Bone: Convulsions of Two Kinds; "Slight," without Loss of Consciousness, confined to the Muscles of the Right Side of the Face and Tongue; "General" preceded by a well-marked Aura, and attended by Loss of Consciousness: Right-sided Post-epileptic Hemiplegia; Post-epileptic Aphasia.*

R. C., æt. 23, single, a sailor, was admitted on 29th August 1875, complaining of intense pain in the left temple and left ear, difficulty in speaking, and fits.

Previous History.—At the age of sixteen he contracted syphilis. The attack was a severe one, and he has never been well since. Fifteen months ago he began to suffer from pain in the left side of the head. Soon afterwards he began to take fits. Four months ago his speech became affected. For several weeks past the headache has been intense.

Family History.—Unimportant.

State on Admission.—He is thin and emaciated. There are numerous white cicatrices, the remains of tertiary ulcerations, on the arms and legs. The left temple is swollen and tender to the touch; the swelling is hard, and extends backwards towards the left ear.

Expression and Mental Faculties.—The expression is dull and heavy; it may be called epileptic, for so characteristic is it that my friend Dr Herbert Major, in coming into the ward, at once said "that is an epileptic." The patient is intelligent and well educated. His memory is very defective.

Sensory Functions.—He complains of great pain all over the left side of the head, and of numbness in the right thumb and right side of the face. Sensibility seems otherwise natural. The pain is always worse at night, and is sometimes agonizing. He sleeps badly, and is much disturbed by dreams.

Speech is hesitating and difficult. He seems unable to get hold of the word he wants, often stopping in the middle of a sentence, frequently stammering and repeating the same word over and over again. He can repeat the alphabet after me readily enough, but when he attempts to say it alone he sticks after a few letters, and says he cannot say the rest. He is, too, unable to write it. Twitchings of the facial muscles are very frequent during his attempts to speak.

Special Senses.—*Sight* is considerably impaired in the left eye, less so in the right. The right pupil is irregular and fixed. On ophthalmoscopic examination, marked neuro-retinitis is seen in both eyes; in the left there is a considerable effusion of lymph about the disc. *Taste* and *smell* are natural. *Hearing* in the left ear, both to external and skull sounds, is, he says, gone. Hearing in the right side is normal, except that he professes not to hear the skull sounds when the tuning-fork is placed over the swollen part of the left temple. This observation was repeated several times, and always with the same results. The skull sounds were conducted from all other parts of the head, the right ear being of course closed by the finger in the usual manner.

Muscular System.—The gait is somewhat peculiar, the patient swaying from side to side every third or fourth step. There is no paralysis, but he says he has loss of power in the right side after the fits.

The Convulsions are of two kinds: slight and severe. In the slight form the muscles of the right side of the face and tongue are alone affected, and the patient does not lose consciousness. In the severe fits all the muscles of the body are convulsed. The severe fit is always preceded by a well-marked aura—a stinging sensation in the tip of the right thumb, which quickly passes to the fingers of the right hand, and thence up the right arm to the cheek; he then loses consciousness, and is convulsed. The spasm begins in the right hand and right side of the face, but soon becomes general. The right side is, however, always affected much more powerfully than the left. I was never able to ascertain the exact manner in which the spasm commenced, *i.e.*, whether in the hand or face.

The severe convulsions are generally followed by loss of power in the right side of the face, in the right arm, and sometimes in the right leg. The aphasia, too, is always worse after a bad fit.

The *co-ordination* and the *reflex functions* are natural.

The *temperature* is 99° F.; the *pulse* 100.

The *other organs* are natural.

The *treatment* consisted in the administration of full doses of iodide of potassium and the application of tincture of iodine locally.

Subsequent progress of the case.—On 9th September he was almost free from pain, and was sleeping well. The swelling and tenderness over the left temple had almost disappeared. The power of hearing was returning in the left ear. There had been no severe fit since his admission.

On 10th September he fell off his chair and remained unconscious for two hours. The attack was not attended by any convulsive spasm. When he came to himself he could not speak, and was quite unable to move the right arm, leg, or right side of his face. I saw him eight hours after the attack. He was then beginning to regain motor power and could say a few words. He could move his tongue in any direction, but was some time in making any particular movement with it after having been told to do so.

On 12th September he was very much better. The paralysis had almost passed away. The urine contained large quantities of phosphates.

On 1st October it was noted: For some days past the face has been swollen and puffy about the eyelids. The swelling exactly resembles the œdema of Bright's disease; it is worse in the morning; there is no pain nor redness, nor is there any trace of conjunctivitis. The urine contains no albumen, but is loaded with phosphates.

On 7th October the iodide was discontinued on account of dyspepsia, and a mixture containing iron and quinine was subsequently ordered.

On 14th October he had a severe fit, but it was not followed by paralysis.

On 17th October there was another severe fit.

On 21st October there were two general convulsions. The iodide was again prescribed.

On 28th October he felt so much better that he applied to be made an out-patient, and was discharged accordingly. Since the iodide was recommenced there had been no severe convulsion. He was free from headache, sleeping well, and eating heartily. Sight was considerably improved, the swelling of the discs had almost disappeared, but there was still some lymph remaining about the vessels.

The patient attended, after his discharge, as an out-patient, and continued to improve.

On 6th January 1876 he felt sufficiently well to be able to take a situation as a brewer's travelling clerk. For some months previous to this date he had not had any severe convulsion. He still suffered from slight fits, which he described as "a choking sensation in the throat." He found that reading or fixing his eyes intently on any object, invariably brought on one of those choking fits. He still continued to take the same dose of the iodide.

Toward the beginning of October 1876, the fits became more frequent and the headache returned; his mental condition underwent a marked alteration; he became stupid and childish; his memory, which had greatly improved, again failed.

On 30th October he was readmitted under my care. For several days he had been quite "wild" and unmanageable. He had a severe fit in the train on his way to the hospital. On admission he was stupid and excited, throwing himself about and talking wildly. The tongue was very foul and the pupils markedly contracted. His mother stated, that for some days he had complained of a pain at the back of his head, more to the right than to the left side. A brisk purge was administered, ice bags were applied to the head, and the iodide was again prescribed (xxx. gr. three times daily), together with mercurial inunction.

On 3d November he was improving; the quantity of iodide was increased (xxx. gr. five times daily).

On 20th November he was very much better, the fits less frequent, the headache less severe.

On 27th November he was worse, shouting out continuously because of pain in the back of his head. Opiates, bromide of potassium, and chloral hydrate were all in turn tried. The dose of iodide was discontinued.

On 9th January he was free from pain, but very stupid and imbecile. He had a severe convulsion and several slight ones.

On 12th January it was noted: He has been very costive for several days, two drops of croton-oil being required to produce a moderate evacuation.

On 12th February he was very much worse. On this day he had eighteen or twenty slight fits.

On 13th February he was completely comatose, passing his urine and fæces in bed. He continued in this condition for five days, and then, contrary to expectation, recovered.

On 18th February he was sensible, but unable to speak; the lower jaw seemed retracted.

On 20th February a papular eruption, exactly like the eruption of smallpox, appeared on the face and upper half of the trunk. Some of the papules subsequently became pustules, but none were umbilical. Ten drops of liquor strychniæ were ordered to be taken thrice daily. From this date he improved.

On 22d March he was better than he had been for months.

On 23d March he had a severe general convulsion. The iodide was again repeated, and a mercurial bath was ordered every other day.

On 31st May he was discharged considerably improved, but still unfit for work. He continued to attend from time to time as an out-patient. When last seen, 1st July 1878, he stated that the fits occurred on an average once a week, that he very seldom suffered from headache, and that he was able to do housework, run messages, etc.

Remarks.—The case is a good example of the ups and downs of cerebral syphilis, and strikingly illustrates Heubner's remarks on this subject. He says—"But what gives to this disease (*i.e.*, cerebral syphilis) its special peculiarity is not the somewhat rare occurrence of a rapid transition into symptoms leading to a fatal end, but rather the fact that this cerebral disturbance, apparently so severe, and hardly capable of recovery, may sometimes, under suitable treatment, but sometimes without it, be completely removed, and again give place to an almost normal condition. The peculiarity which, in addition to the great varieties of the symptoms, gives to cerebral syphilis this paradoxical, vacillating, startling character, is this, that its accidents, just as they develop unforeseen up to a certain intensity, may again vanish in the same remarkable way."[1]

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[1] Heubner on Syphilis of the Brain and Nervous System, *Ziemssen's Cyclopædia of Medicine*, vol. xii. p. 327.

The practical lesson to be drawn from such cases is, that however grave the symptoms may be in a case of cerebral syphilis, the prognosis is never utterly hopeless; and since the syphilitic is the only form of intra-cranial tumour, which, so far as our present therapeutic resources go, can be with any certainty influenced by treatment, it behoves us in all cases of cerebral tumour to adopt an energetic anti-syphilitic treatment — large doses of iodide of potassium, 30 or 40 grains three times daily, and mercury, until moderate salivation is obtained.

In the administration of the iodide I at once begin with the full dose—30 grains three times a day—and I have no hesitation in continuing it for months. I have never seen albuminuria or any bad result, other than a temporary dyspepsia, produced by it. This particular patient, for example, took 30 grains of the drug three times daily for at least twenty months without the slightest injurious effect.

Before leaving this case I should like to draw attention to the fact that œdema of the face, exactly resembling the œdema of Bright's disease, was associated with the presence of phosphaturia. I have met with at least three other examples in which the same circumstance occurred; in all three cases the urine was carefully examined for albumen both during and after the attack, but none was found.

Another point worth noting is the fact that an eruption, at first papular, afterwards pustular, appeared on the face and trunk after the internal administration of large quantities of croton-oil. This was probably only a coincidence, for Professor Sydney Ringer tells me he has never heard of the internal administration of croton-oil producing pustules. I should perhaps add, that some time before the occurrence of the rash the iodide and bromide of potassium had been discontinued.

(To be continued.)

ARTICLE V.—*On Hydrophobia: Its History and Cure.*
By Dr ANDREW WILSON.

(Concluded from page 212.)

ONE of the most unaccountable features of this disorder has long been recognised in the varying periods of incubation, which intervene between the reception of the poison of hydrophobia and the manifestation of the symptoms of the disorder. This fact is one of the best known regarding the disease, and it is not without its due and often serious effect on the popular mind. For, as may readily be supposed, a person once bitten by a dog which has been rightly or wrongly supposed to have been rabid is regarded, through the belief in a long period of incubation or latency of the disease, as a doomed man. With a sure and fixed idea regarding the eventual appearance of the symptoms, and with the knowledge that the disease *may* manifest itself after the lapse of a long interval between the bite and the occurrence of active symptoms, the unfortunate individual may be said to live with a veritable sword of Damocles suspended over his head. As we shall afterwards note, a person who has been bitten by a hydrophobic dog is by no means to be regarded as a patient either certain of death or hopeless of cure. And one very important effect of the common belief in the invariable occurrence of hydrophobia after the bite of a rabid dog, is that of inducing a nervous horror of the disease, and of inciting a mental state which unquestionably predisposes to the exhibition of its symptoms. A belief no less erroneous and injurious than the preceding, is that which maintains that a person bitten by a perfectly healthy dog will become hydrophobic if the dog should subsequently become rabid. That this belief is absolutely without foundation, is a conclusion which can be readily arrived at from the exercise of a little common sense, apart from scientific knowledge. Cases in which the bite of a dog, alleged to have been perfectly healthy, has produced symptoms of hydrophobia, will probably be found to present evidence that the dog has not been wholly free from indications of canine madness. Indeed, as every investigator into this matter well knows, even a case which at first presents him with the plainest record of circumstances, will be found on closer examination to require both time and trouble to procure exact evidence of the state of the dog—that is, evidence which will satisfy the demand for accuracy on the part of the scientific investigator.

The fact, however, that a longer or shorter period of inactivity of the poisonous principle, or a period of "incubation," as we have termed it, intervenes between the bite and the occurrence of active symptoms of hydrophobia, is indicative of the specific nature of the disease. In all disorders arising from the exhibition and development of a special poison within the living body, a latent period occurs. During this period the virus may be supposed to develop its strength and characteristic properties. Assuming that the poisonous material is analogous in its nature—as most physicians now regard the *materies morbi* of specific diseases to be—to low forms of animal or plant life, we may readily explain the occurrence of a period of incubation by a reference to the phenomenon of development, and by supposing that the specific organisms contained within the virus require a certain period to accommodate themselves to their surroundings. A drop of yeast introduced into a sugary solution contains a few *torulæ* or yeast-plants. After an interval, the action of fermentation begins within the solution; and we explain the interval that elapses and the ensuing and characteristic action that commences, by saying that the original and introduced torulæ have been developing others in immense numbers, and that only

when enough yeast-plants have been produced does the fermentative action begin to be plainly exhibited. When a minute quantity of vaccine matter is introduced on the point of the physician's lancet through an abrasion of the skin into the blood-circulation of the infant, a latent period ensues. For hours no alteration beyond a certain redness of the arm can be detected. But by-and-by, the indications of the mild fever which is to protect the child against the more formidable smallpox begin to be both locally and constitutionally manifested. The seat of the operation exhibits indications of a very characteristic action, whilst the constitution generally participates in, and sympathizes with, the effects which at first were locally produced. In this latter case, as in that of the production of fermentation by yeast, we assume that the minute particles of the vaccine matter, like living organisms, required time to accommodate themselves to their new surroundings within the body, and that when they had become sufficiently developed their characteristic effects were made apparent.

In the light of such knowledge, we can readily imagine that the poison of rabies, when introduced into the blood-circulation of man in the saliva of the dog, requires a longer or shorter period—the period of incubation—for the full development of its powers, and for the exhibition of active indications of its presence. The periods of incubation which the hydrophobic poison appears to exhibit vary from one to two or three months. But the most notable point regarding the case before us, as already remarked, consists in the *varying duration of the periods of incubation* through which the virus may pass. Exceptional cases, on the side of shortness of the period of incubation, are recorded, in which active symptoms set in on the eighth day after the injury. On the side of prolonged periods of incubation there are well-authenticated cases which show that symptoms of the disorder may intervene after four, five, seven, and even twelve years. Dr Bardoley, in *Medical Reports of Cases and Experiments* (London, 1807), relates a case in which the last-named period intervened between the bite and the appearance of symptoms of hydrophobia. From the *Lancet* we glean particulars of a very instructive case, communicated by Mr Rigden, of Canterbury, in which two patients were bitten at the same time by a rabid cat—this animal having been infected through the bite of a rabid dog. The symptoms in the one patient occurred two weeks before they appeared in the other, notwithstanding the correspondence in the date of the infection. In the *Lancet* for 1829, a Dr Elliotson relates that two little girls were bitten at the same time and by the same dog. The child who was the second to be attacked by the animal became hydrophobic and died. Her sister experienced all the premonitory symptoms at the same time, but recovered completely. Of twenty-one persons who were bitten by a rabid dog, according to John Hunter's account, only one suffered from hydrophobia; and of seventeen persons who were bitten by a mad wolf, ten died. In another case, of similar nature to the last, in which twenty-three were bitten, thirteen died. Sir William Gull had a case, in which hydrophobia supervened after a five years' period of incubation. With regard to the general period of incubation, statistics show, as has just been noted, that the normal length of the period in man extends at most to a few weeks. Eighteen days may be deemed a short, and three months an extended period of incubation, judging the length of this period by a normal standard. Records of experimentation on dogs support the idea that the latent stage is by no means of long duration. M. Renault published in 1862 the results of a series of experiments, in which dogs were infected with rabies through exposure to the bite of animals suffering from the malady. One hundred and thirty-one dogs in these experiments were bitten by rabid dogs, or were inoculated with the saliva of their rabid companions. Of this number, sixty-three exhibited no symptoms whatever at the end of four months. In the remaining sixty-eight rabies appeared. The shortest interval between the period of infection and the occurrence of active symptoms was five days, the longest interval being 120 days. In twenty-five of the sixty-eight dogs, rabies set in between the 5th and 30th day, in thirty-one dogs between the 30th and 60th day, in seven between the 60th and 90th day, and in five between the 90th and 120th day. Thus a period of latency extending from the 30th to the 60th day was by these experiments shown to be that which was most frequently represented in the dog. Other observations show like variations in this period in the case of the dog.

Can any explanation be afforded of the variations in the period of incubation in man and in lower animals? To this question only a very qualified answer can be returned, although at the same time the circumstances of hydrophobic infection and of its variations in respect of its development can be readily shown to relate themselves to the phenomena exhibited by other specific diseases. A period of incubation has been already shown to be a perfectly natural occurrence in such diseases. That the period of incubation in fevers and other disorders varies according to the age, constitution, sex, and temperament, and state of health of the patient, is a fact admitting of no dispute. Mr Rigden's case, and that of Dr Elliotson, already quoted, is susceptible of explanation only on the latter hypothesis. And in the case of the experiments on dogs, it is highly probable that differences in the breed of dogs, and in their constitutional peculiarities, determine in favour of or against the speedy occurrence of the symptoms of hydrophobia. There are well-known instances of human beings who exhibit a special liability to the attack of certain disorders, and of others again who seem to pass scatheless under circumstances of the most trying kind. There are also certain races which, as a whole, escape the attack of diseases to which other races are subject—these facts pointing to peculiarities of constitution in the individual, or in the race, as the cause of susceptibility to or immunity from disease. And so may we imagine the advent of hydrophobia and rabies in man and in lower animals may be influenced, either as regards the shortness or the extension of its latent period. This explanation, it is true, may be regarded as dealing more with the general principles of hydrophobic infection than with its exact *rationale.* But the science of the causation of disease has not yet advanced sufficiently far to enable us to point to the exact circumstances which favour the development or retard the growth of the virus. The field of inquiry, however, is one to which the general facts just mentioned clearly point the way.

The importance of a clear understanding of the nature and prevention of hydrophobia is made clear by the returns of the Registrar-General, in which the number of deaths from this disease are duly recorded. In 1838 we learn that 24 persons died in England of this disorder. The next year in which the disease attained a high development was 1848, when no less than 27 cases occurred. Seventeen cases are recorded as having occurred in 1849, 13 in 1850, and 25 in 1851. In the period extending from 1856 to 1866, 93 cases are recorded, and of these 93 cases, 36, or more than a third, occurred in 1866. This latter year saw the largest number of cases since the practice of registration began. The population at the middle of 1866 was estimated at 21,210,020, and about two cases of hydrophobia to each million of the population was therefore the proportion represented in that year. In the preceding year the fatal cases of hydrophobia did not show half this proportion. In 1870, as the next year after 1866 when the number of cases rose, 32 cases were recorded—1871 showing no less than 56 cases. Thirty-nine occurred in 1872; 28 in 1873; 81 in 1874; 47 in 1875; and in 1876 over 50 cases at least. In 1877, 16 cases are stated as having occurred in London alone, up to the end or near the end of November; but there can be little doubt that a large number of cases will have to be added to the returns for 1877. Statistics of this disease discover some remarkably curious facts relating to the persons bitten, and also to those who escape hydrophobia, although placed in circumstances of a kind likely to engender the affection. The recent report of the Postmaster-General contains the peculiar information that in 1876, in a large town in the south of England, 20 per cent. of his officials, or 1 in every 5, were bitten by dogs. What may be the conditions to determine the affinity of dogs for these southern letter-carriers is a thought left to the imagination of the reader; but for the satisfactory discussion of the matter, we should require statistics of the total number of persons bitten in the town referred to, as well as information relative to the habits and practices of the Post-Office officials, and to the cases (if any) of hydrophobia which appeared, and the results of treatment. Very interesting is it to find the secretary of the Home for Lost Dogs at

Battersea informing us that not a case of hydrophobia has occurred in the metropolitan police, whilst no case has occurred at the Dog's Home within the last seventeen years. The head-keeper has been frequently bitten, and sometimes severely, and presumedly by all kinds of dogs, without once suffering any inconvenience beyond the mere local pain resulting from the injury.

Can the origin of hydrophobia be accounted for, and have we any definite information regarding the interval, or effects of external and physical conditions on the disorder? are queries which may appropriately be asked and answered at the present stage of our inquiries. That rabies was known to occur in the dog in classical times is well ascertained from the records of the classic scientists, but it is highly probable that the disease assumed importance in England so lately as the beginning of the present century. It was, however, well known in Europe three hundred years ago. It has never occurred in Australia, nor in New Zealand, whilst other parts of the world in which European dogs exist, and where native dogs, or carnivora closely allied to dogs, occur, are also exempt from the malady. It is now known to exist amongst Arctic dogs, and it occurs amongst the canine races of China. Hydrophobia has never been certainly known to be produced save from the bite of a rabid dog, and the belief that hydrophobia rarely, if ever, reproduces itself, or is not capable of being communicated from one human being to another, seems, as far as our knowledge goes, placed on a basis of fact. There is, of course, no chance of witnessing the effects on the human subject of inoculation with the saliva of a hydrophobic patient; and, indeed, there is as little chance that infection in any ordinary case could be propagated from that source. The entire question of the origin of hydrophobia, therefore, turns upon the determination of the origin of rabies in the dog. Exterminate the latter disorder, and hydrophobia would, of course, completely disappear. It cannot be said that the information which a study of the "surroundings" of rabies affords leads to the formation of any definite opinion regarding its origin. The very common notion that rabies is engendered or favoured in its development by summer heat—a belief which has given origin to the term "dog days"—has been long ago proved to be utterly unfounded. Rabies appears in all seasons. Nor does the want of water produce the disorder, since experimentation on this head—cruel, but justifiable from the information it affords—has shown that a dog may die of thirst, but will not, on account of the want of water, become rabid. Want of food will not produce the disorder, neither does over-feeding act as its cause. It is more common in male dogs than in females—a fact probably explained in greater part by the greater preponderance of the male sex in the canine races. The bite of a furious or enraged but healthy dog, as already remarked, does not produce rabies in another dog, or hydrophobia in man, nor does the breed favour or discourage the disorder. Mongrels and curs are more frequently affected, simply because they are more exposed to the attack of their rabid neighbours. And no age, lastly, is exempt from rabies, the disorder being found in very young as well as in very old dogs. These considerations lead to and strengthen the important idea of the highly *specific* nature of the disease. Many of the foregoing conditions, which of themselves are utterly incapable of *originating* rabies, will tend either to favour or retard the disease when once it has appeared.

The consideration of the circumstances under which the disease may be communicated to man reveals some features of practical interest. Mr Youatt, one of the greatest authorities in veterinary science, maintained that it was impossible that the saliva of a rabid dog could affect the human subject if allowed to come in contact with the unbroken skin. He himself had had his hands covered many times with the diseased secretion. Mr Youatt, however, maintained that the secretion *might* affect man if brought in contact with the mucous membrane of the lips or mouth. A man who, with his teeth, had untied a knot in a cord which had been used to secure a mad dog, and a woman who had pressed with her teeth a rent in her dress after being sewed—the said rent having been torn by the teeth of a rabid dog—were respectively affected by hydrophobic symptoms, both cases terminating fatally. These cases would seem to point clearly to infection through the mucous membrane from dried virus which had remained in the cord and on the dress. Respecting the question we have already alluded to, namely, the possibility of infection of one human being from or by another suffering from hydrophobia, Mr Youatt held that such infection might occur. Experiments made with the view of ascertaining whether dogs could be inoculated with saliva from the hydrophobic human subject have signally failed, save in one instance, which, however, is not free from doubt. But one plain conclusion is deducible alike from facts and experience, namely, that the utmost caution should be exercised by those in attendance on a hydrophobic patient, seeing that there exists the chance that inoculation with the patient's saliva might produce the dreaded disorder.

An article like the present would be incomplete without a reference to the means adopted for the prevention and cure of hydrophobia, seeing that the previous statements naturally lead up to such a conclusion. We have already indicated a very important duty—not merely on the part of the public at large, but especially on that of the police —at the outset of these remarks—that of distinguishing between a case of true rabies and where an unfortunate dog is suffering from a fit, or, what is a more common case, where a dog pursued and hunted by boys is regarded as mad. If the public have to choose between the alternatives of "mad dog" and "dog in a fit," they will be on the correct side in nine cases out of ten if they adopt the latter opinion. Rabies, after all is said and done, is not a common affection, but is one, nevertheless, which a diseased public imagination will cause to be regarded as alarmingly prevalent. Suppose, however, that a rabid dog has inflicted a wound, the main and important question of "what is best to be done" has to be answered on the spot, and, it may be, by the non-professional bystander. It argues powerfully in favour of the movement for teaching the principles of human physiology in all our schools, that the answer to this question is readily forthcoming from a consideration of the subject of the blood-circulation, and of the means to be taken for preventing the diffusion of the virus through the system. The rules to be acted upon in the case before us are those which teach us the right method of treatment in all cases in which a poison has gained admittance to the circulation. Rule first reads thus:—"Prevent the diffusion of the poison through mechanical and other means." All surgeons agree in recommending immediate *excision, i.e.*, the cutting out of the bitten part, as the safest procedure. To this rule there can be no difficulty or hesitation in assenting, provided there are forthcoming the surgeon and his anæsthetics. By the use of the latter all pain is avoided, and the treatment thus indicated, apart from the question of pain, is that considered the most effective by all authorities.

But suppose medical aid is not forthcoming, what is then to be done by the bystander? The answer is, tie a bandage tightly just *above* the wound, for the purpose of arresting the venous circulation, which is, of course, tending to diffuse the poison through the circulation. Next, try to wash away, as soon after the infliction of the wound as possible, the poisonous material. Probably the best method of attaining the latter result is that of placing the wounded part under a strong douche or stream of cold or tepid water, and of allowing the water to play with some degree of force on the wounded surface, for at least an hour or longer. Thereafter, according to Mr Youatt's belief, the safety of the sufferer would be secured by having the wounds well cauterized with nitrate of silver (lunar caustic), a substance which, in his own hands, proved eminently successful in the treatment of dog-bites. The common-sense rules of first and speedily adopting measures calculated to eliminate the poison from the seat of the wound, of arresting its diffusion through the bloodvessels, and thereafter of securing the further immunity of the wounded part by destroying as much of the surrounding tissues as possible. Curare, the famous arrow poison, has been employed with success in one case, and high authorities agree in recommending the use of the Turkish bath by way of assisting in the elimination of the poison. But the chief matter which concerns the public at large is, that of the means to be used on the spot, the after-treatment being a matter for the especial consideration of the physician.

The conclusions regarding hydrophobia to which these remarks lead, may be summed up in the statements, firstly, that it is an affection respecting which much popular misconception exists, and that in consequence a large amount of unnecessary fear and alarm prevail regarding its occurrence; secondly, that hydrophobia is in ordinary cases a curable affection, provided prompt measures are used for its cure; thirdly, that the phenomena of the disease point to its clearly specific nature, and to its being derived in man exclusively from the diseased secretions of rabid dogs and of allied animals; and lastly, that the best means for ensuring the public safety consist in the widespread knowledge of the nature of the disease and of the measures to be adopted for the prevention and cure of the disorder. "Knowledge is power" in truth, in the presence of the sudden danger which a rabid dog or a serpent's tooth, or indeed any other untoward accident, may bring. The knowledge which points the way of safety can in no case be regarded as exaggerating an evil, even although such knowledge deals with details which to non-professional readers may appear unpleasant, and which usually fall to be considered by the physician and surgeon alone. Whilst the diffusion of technical information as a means of averting disease and death may be regarded as exemplifying "saving knowledge" of the most valuable kind.

ARTICLE VI.—*On Curettes and Curetting.* By ALEXANDER KEILLER, M.D., F.R.C.P.E., Consulting Physician for the Diseases of Women to the Royal Infirmary, etc.

(*Read before the Edinburgh Obstetrical Society.*)

THE truth, if not the wisdom, of the proverbial phrase, *Tempora mutantur, nos et mutamur in illis*, certainly applies to this, the Edinburgh Obstetrical Society. The time was, and indeed has not gone long by, when we used to have very few written papers, and such as were then given were short compared to the more lengthy and more carefully-written communications which the spirit of change, if not of improvement, has brought about. I must not, however, and do not specially, object to this obvious change; but having a keen recollection of the benefits derived from the old conversational style of conducting the Society's business, which was always practical, I merely refer to it now when, instead of saying the little I have to say, I must, in order not to be singular, do as others do, read any remarks I may have to make. My object in again bringing up this subject so soon after the reading of Dr Mundé's paper is not to find fault with that communication, or with the views therein expressed, but to tender the results of my own experience on a practical matter in which experience alone can prove the safest, because surest, guide.

From what was said on the evening when Dr Mundé's communication was read, I was strongly impressed with the idea that curettes and curetting would become so fashionable amongst us, that there might be a rushing after them, and that the already sorely-tried and long-suffering uterus might thereby be the reverse of improved.

On that occasion I briefly expressed the opinion I then formed, and promised to exhibit at a future meeting the instrument which I had specially referred to as having, in my practice, long served the purpose for which so-called curettes have been invented and improved. I cannot now offer more than a very few and, I fear, very imperfect remarks on the subject, with which, however, I must beg the members present to kindly bear, seeing that what I have here penned has been very hurriedly done, and which, in all probability, would never have been done had I seen my way to escape the penalty justly due to unfulfilled promises. In treating the matter I shall endeavour to note the points which appear to me to be most worthy of remark, and that without attempting to follow any special order, or to critically consider Dr Mundé's paper, except in connexion with the views which no small personal experience has led me to adopt.

Before referring to the special instruments recommended to be used as so-called *curettes*, I must first and at once express the strong conviction I have been induced to entertain as to the immeasurable safety and, in most cases, superiority of the well-trained *hand*, a single finger of which, through its special tact, being often amply sufficient not only to discover, but, without extraneous or artificial aid, to remedy the various intra-uterine conditions for which the instrumental operation of *curetting* is now so strongly recommended. I firmly believe in what may be termed digital diagnosis, and digital curetting, and that in carefully-trained ambidextrous hands, there will be found an unequalled "gynecological armamentarium," which, being constantly carried about with us, is always within reach and ready for use.

While it may be positively affirmed that the living sensitive finger, educated by the lessons of experience, will ever prove more than a match for the cold, lifeless, and therefore insensible touch of metallic or other instruments, however ingeniously arranged or carefully applied, it is nevertheless obviously true, that in many cases, just because of the limited length, and at the same time bulkiness of the former, and the unlimited length and the comparatively slender proportions of the latter, there is often a necessity for such aids as are calculated to give artificial length and yet diminution to our required tactile movements, be they manipulative, instrumental, or both.

The entire cavity of the uterus, especially when elongated and enlarged, as it is generally found to be, when it contains or retains morbid or other textures demanding recognition and treatment, often proves beyond the grasp of mere digital reach; and this difficulty of immediate tactile examination becomes necessarily increased by the usually closed condition of the os, and frequent narrowness of the cervical canal. Thus, it is no doubt that the diagnostic and remedial use of intra-uterine appliances, be they of a curette or other character, are often called for. Ordinary observation and experience teach this necessity, and which I, with others, daily pursue, although with more caution than I at one time considered to be necessary.

In carrying out the manual system of examination and treatment, not only the general history and features of the case, but also and especially the local condition and uterine precedents of the patient ought to be duly considered, for it will be obvious that while it may be readily enough conducted in some women, as in most married and multiparous females, it may prove, and indeed usually proves, less easy of accomplishment, and therefore less admissible in the virgin and childless state. In the former, the most perfect digital investigation of the interior of the uterus may be successfully made by placing the patient in proper diagnostic position, and dilating and examining, with or without anæsthetic aid. In the latter, although by no means generally so easy, the practice is far from being inadmissible, and when occasion demands such a positive inquiry, there is no reason for rejecting it.

Here, as elsewhere, we must be guided by the special circumstances of the case in hand, and which common experience and common propriety, and though last, not least, common sense will go far to lead us aright.

Curettes, or instruments used for curetting purposes, frequently prove of great service not only in removing morbid and other productions from the interior of the uterus, but also in checking and correcting abnormal conditions of the lining membrane, which give rise to the development of intra-uterine rugosities and vascular conditions which so often prove the source of undue menstruation and irregularly profuse hæmorrhages.

When "intra-uterine fungosities" exist, causing menorrhagia, the sooner their removal is accomplished the better; but prudence and gentleness must be exercised in effecting their separation and expulsion. It is not absolutely necessary to attack them by the more or less violent process of scraping, which curetting too often assumes.

Profuse menstruation and irregular hæmorrhage are doubtless common evidences of vascular and fungoid conditions of the endometrium, which are quite remediable, however, without any special curette operation. In such cases the gentlest immediate pressure may suffice. I have often found the use of a simple sound, such as the one I am in the daily habit of introducing for diagnostic purposes, not only remove the hæmorrhagic symptom for which the instrument was used, but remedy the source of the hæmorrhage, which even a still milder form of pressure, viz., that effected by the injection of warm water, may equally well in some cases bring about.

All that is frequently necessary is simple dilatation, and, if need be, gentle distention. I have often adopted this, the safest of all curetting measures, viz., that of laving and thereby gently washing out, instead of scraping and thereby tearing out, the hæmorrhagic or other exciting cause of the uterine disturbance.

This comparatively simple and safe method of clearing out, without irritating, the cavity of the uterus has, I am persuaded, been too long neglected, seeing that it can be usually accomplished without difficulty or danger. I have long practised it, and have by means of a very simple process frequently succeeded in washing out uterine contents which might have proved mischievous.

The result obtained here is exactly that of curetting, with the difference, perhaps, that it is or may be obtained without the risk of unduly kindling up uterine disturbance, which may be difficult to subdue. It is known to all who have had experience in the investigation and treatment of uterine ailments, that susceptibility to general and local causes of irritation varies very much in different cases. What may cause little or no mischief or discomfort in one case, may kindle up dangerous and even deadly symptoms in another.

The determining of the pathological condition of the uterus in hæmorrhagic and other cases being of the first importance, it is often necessary and proper to have recourse to artificial dilatation of the os, so as to admit of sufficient digital examination of the interior of the uterus. This is usually accomplished by sponge or other tents, the use of which alone will sometimes be found to put an end to the symptoms, for the investigation of which this diagnostic dilatation may have been practised. The *rationale* of unanticipated cures in such fortunate cases is similar to the *modus operandi* of so-called "curettes," whatever material they may be made of, or whatever form their construction may assume. In fact, sponge, tangle, or other tents may be thus made to act as sounds, stems, and other intra-uterine explorers frequently do, and as curettes do, or rather ought to be made to do; not certainly by scraping, or otherwise coarsely treating the too vascular lining membrane of the uterus, but by simply tracing, and to a certain extent compressing, its surface with the view of finding out whether anything foreign to its natural condition can thereby be ascertained and remedied.

The normal lining membrane of the uterus can, no doubt, bear a great deal of rough handling. Its own natural exfoliations prove it to be deciduous, and therefore changeable in its character; but it cannot be too studiously remembered that there is a mighty difference between a naturally induced process and one artificially and rudely forced.

Although endometritic products, apart from pregnancy or abortion, give rise to hæmorrhagic and other discharges which curette treatment may radically remove, it is oftener in cases connected with previously deranged utero-gestation where placental and membranous remnants are retained, their retention giving rise sooner or later to increased turgidity, and ultimately to recurrent or even continuous hæmorrhage, during the investigation of which their true source is usually ascertained, though previously unsuspected.

The ready diagnosis, successful removal, and consequent subsidence of the, it may have been, long-continued and dangerously exhausting discharges, usually prove exceedingly satisfactory in cases of this kind, where all that is required to effect a speedy and lasting cure is the removal of the adherent placental masses or villosities which nature may have been labouring under difficulties to discharge.

[Only the other day I witnessed an illustrative case along with Dr Pridie, whose note I here introduce.

"On 1*st September* 1878, I was requested to visit Mrs ——, aged 27, 4½ months married. While in London, a month previous, she miscarried at about the 3½ month. On her recovering so far as to get up, she went out of doors as usual in London. A fortnight afterwards severe flooding came on; when it disappeared she came down by rail to Scotland, and was constantly moving about, walking or otherwise. On the day before I saw her, among other places she walked to the top of Arthur's Seat; in the evening she had to retire to bed on account of a return of flooding, which she had of late been so accustomed to as not to regard it as anything uncommon; but its increasing during the night alarmed them. Her husband's friends, being old patients of mine, made them anxious that I should attend her; it was, however, late in the morning before I saw her; she was then quite blanched, greatly exhausted, and still flooding; everything about the bed was saturated with blood, although the clothes had been removed two or three times. I was then informed of the miscarriage, and assured by her husband that at the time everything was believed to have come away. I introduced the hand into the vagina with difficulty, and with the point of the finger touched what I suspected to be a retained placenta, but could not grasp it, from the contracted state of the parts; as hæmorrhage was still going on I withdrew the hand, and introduced high up into the vagina a sponge with a tape attached, and plugged by means of a larger one as well. This arrested the flow of blood; some brandy and water was then given with opium. On her fairly rallying, she took full doses of an infusion of secale cornutum, and afterwards slept well at intervals. Next day her colour had returned, and she was able to take food as usual. On the 3d, after a dose of castor-oil, taken of her own accord, and which acted freely, she vomited some of the food she had taken the day before; at the same time both the sponges were expelled, without any return of the hæmorrhage. Though still weak, she had made up her mind as soon as possible to return to the South of England by easy distances. This I objected to, from the danger of travelling with a retained placenta, and suggested that Dr Keiller should see her. In consultation with Dr Keiller, the small placenta, partly adherent, was removed with little difficulty. She has since, by good nursing and nutritious food, made a good recovery, at the same time taking small doses of sulphate of quinine at short intervals."]

The terminating of such cases by the curette or otherwise is generally so evidently successful—the patient being, as it were, rescued from pending dissolution, and so shortly thereafter regaining her lost strength—that the party who has been fortunate enough to see and treat the case when perhaps little or no special tact or manipulative skill was required, beyond expediting the completion of the process of separation and expulsion naturally going on, receives undue credit for performing what may be deemed no ordinary marvel.

In his paper Dr Mundé dwelt on the great ease with which the curette can be used, spoke of the almost complete harmlessness of the instrument, and lauded its efficiency in strong terms.

I cannot think so well of the curette, and for this simple if not ample reason, that, although there may be little difficulty in using it, the very ease with which it can be used may lead to the abuse of a useful and safe instrument, and in many cases go far to counteract not only its harmlessness but its curative efficiency.

Dr Mundé in his paper expresses himself, I think, too strongly in regard to the absence of any difficulty in using the instrument he referred to, which was that of Dr Thomas, a drawing of which was exhibited to the Society. The curette he prefers and uses is no doubt a small instrument, and in most cases in which curetting is called for its introduction would not likely be attended with difficulty; but apart from the comparative ease in applying the "dull wire curette of Thomas," there is something else to be considered, viz., the free discharge of what may by it be separated from the interior of the uterus. This I hold to be of consequence, and therefore make it a point to see that the os and canal of the cervix will offer little or no obstruction to the exit of blood or more firm substances requiring expulsion or free discharge.

The instrument which I have hitherto been accustomed to use for exploring and curette purposes is larger in its eye extremity, and therefore may require a more dilated condition of the cervical canal than the smaller eye of Thomas's instrument demands; but, nevertheless, I consider it important not only to have sufficient space for the easy and painless introduction of even a small curette, which, in the gropings often necessary to overcome contractions, resulting, it may be, from chronic induration or flexion, or other cause of encroachment on the cervical space, frequently causes irritation and denudation of surfaces, which it is better to avoid.

It may be true that, as a rule, the application of a curette is far from difficult, and that, generally speaking, little or no preparation of the part involved is necessary; but such ease of application and uncalled-for previous preparation do not always obtain, for not only do difficulties frequently occur in the introduction of the instrument, but previous dilatation of the cervical canal is required.

I have so long and so often used the instruments I now exhibit, and which are to all intents and purposes curettes, that I think I now know the occasions on which they ought to be used, which, however, are much less frequent than I at one time held them to be.

So long as our instrumental or other artificial appliances are cautiously and judiciously used for the purpose of aiding, and not forcing, nature to secure a remedy for her occasional distress, we cannot fail to do good, especially in well-selected cases; but when we allow ourselves to be led to have frequent recourse to the rougher measures of scraping, shaving, or gouging, which the suffering uterus is too commonly subjected to, we need not be astonished if our cures are very exceptional, compared to what we may find recorded by " authorities " in whose guidance we naturally enough confide.

The present observations are more applicable to the sharper, and therefore more dangerous, form of instrument than to that of the "dull-wire curette" devised by Dr Thomas, and so highly extolled in the excellent communication with which Dr Mundé has been good enough to favour our Society.

I quite agree with Dr Mundé, and with the authors he has named, as to the comparative safety and merits of an instrument not only considerably blunted and smoothly rounded, but formed of a ductile or flexible material, and not, as in the various curettes formerly used and recommended, for cutting or scooping the endometrium, made of sharp-edged and inflexible steel.

In the use of such sharp-cutting curettes I have long ceased to be a practising party, and heartily concur in Dr M.'s observations to the effect that in this milder kind of uterine surgery (or what I now venture to designate the Surgery of the Endometrium), it is better to abolish the use of such risky instruments as those of an inflexible nature, and presenting sharp-cutting edges, unless absolutely required for the disintegration and separation of dense and too firmly attached neoplasms and other growths found to be inseparable by the dull-wire or other comparatively flexible and safe form of curette.

While I believe with Dr Mundé that the "dull-wire curette" of Thomas is a vast improvement on the older and sharper " subacute " (or rather too acute) curettes of Récamier, Sim, and others, that its application is usually easy and harmless, and that its efficiency in proper cases and in proper hands—*i.e.* in the hands of those accustomed to interrogate and to treat the varying conditions of the uterine cavity—may, as a rule, be depended on; nevertheless my experience and observations as to the capabilities of even the dullest curette, while it corroborates his views as to the folly of subjecting patients to all sorts of useless treatment when such a ready and effective remedy is at hand, by no means lead me to join in his strongly-expressed opinion as to this, or indeed any such, instrumental procedure proving so constantly, positively, and immediately curative, *as to enable the ordinary family physician at the very outset of such special cases thus easily, safely, and speedily to effect their radical cure.*

It may be quite true that illustrations, even by the thousand, can be cited in proof of the curative value and the apparent innocuousness of the curette mode of treatment; but this does not meet the reasonable objection to the putting of even such a comparatively safe instrument into untried hands unchecked by due cautionary hints which appear to me to be called for, otherwise I would not have ventured the present observations, which probably in an unthinking moment I at our last meeting promised, not with the view of opposing even the frequent recourse to—but rather of securing the proper and prudent application of—*curettes and curetting.*

Although the uterine function or functions—for the uterine bag discharges various functions—be exposed to disorder from within and from without, it is gifted with a wonderful power of self-government and resistance, and which, with all its tendencies to remain anything but quiet, would enable it to recover itself better if less interfered with than it is.

I will not press this notion further, and only hint at it now, because I consider this a good opportunity of expressing the conviction which I must say is growing upon me—the conviction that although the uterus and the uterine system get functionally and organically out of order, it by no means follows that we are justified in rushing to the conclusion that matters can be sooner and best found out to be wrong, or best and soonest put right, by undue pokings, which the too ready adoption of anything like meddlesome measures necessarily imply. I greatly fear that, pressed as we often are to do something to remove the morbid conditions of women, be they imaginary or real, the scientific and proper practice of gynecology suffers with the sufferer.

The comparatively unsettled behaviour of the womb structures in the periodic and oft-repeated changes before, during, and after menstruation, pregnancy, and delivery, lays the uterus, above all other organs, open to the charge of, as it were, inviting interrogation and supervision. This naturally changeable nature, especially of the inner surface of the uterus, explains in some measure

its marvellous tolerance of the soundings of sounds, scrapings of curettes, and such like gynæcological inflictions.

It is not by any means always advisable to have a specially constructed instrument for every conceivable purpose, and for this obvious reason, that the possession of special tools too often foster an itching after opportunities to use them, especially if their use has been lauded by those whose assurances of success lead us to go and do likewise.

In thus urging the exercise of prudence in regard to the recommendation and use of intra-uterine appliances, I may be charged with having an undue dread of their danger, but my present desire is not so much to influence those who know in what cases and how they ought to be applied, but to caution others who may be induced to trust too much to their innocuousness.

I confess, however, to having a special dread not of the proper but of the improper use of any instrument, such as might be had recourse to by the unscrupulous, who may in an evil hour be led away by the apparent ease and safety of its application.

I am here on the present occasion not to condemn, but only to caution anent a practice which I think is very apt to be inaptly used and unintentionally abused.

I have no objection to offer against the opinion expressed by Dr Mundé, as to the dull wire curette "occupying a high place in the modern gynæcological armamentarium," but I am anxious that it, like all others, even of our most serviceable implements, be handled at all times with the utmost caution, otherwise I do not think I would have been rash enough to promise any special observations on the subject, or to have troubled the Society with the present remarks, which have been hurriedly considered, and, I feel, very imperfectly expressed, but which I know will be accepted in the spirit I now offer them.

ARTICLE VII.—*The Sewage Question.* Number VI. By ANDREW FERGUS, M.D., Glasgow.

(*Continued from page 256.*)

ATTEMPTS have been made to purify sewage by application to the land in two different ways, viz., surface irrigation and downward intermittent filtration. At first it was supposed that growing crops would absorb directly all the organic matter, and that it was only necessary to allow the sewage to pass *over* the land to make it pure enough to pass into streams or rivers at its journey's end. Experience proved, however, that this process was not sufficient, and now in surface irrigation as well as in downward intermittent filtration, the purifying power of the earth as a filter is brought into play. We have already mentioned the power of the air to oxidize organic matter. Filtration through earth utilizes this power, and it must be continually renewed by the re-aeration of the earth. There must be an intermittent supply of sewage; if it is applied continuously the purifying power is lost, and the sewage will pass away, retaining all the original soluble organic impurity. When the sewage is applied properly, *i.e.* intermittently, as it sinks down through the earth, its place is supplied by air, which oxidizes the organic matter and renews the power of the earth filter. When we come to consider downward intermittent filtration, we shall see how carefully this principle has been attended to. The first question to be considered by any local authority who wishes to introduce surface irrigation, is the amount of land required to carry out the process successfully. It was supposed at first that one acre of ground to every hundred inhabitants would be an ample allowance for the requirements of any town. From a table at page 32 of Messrs Robson & Mellis's book, we find that the amount of land used at thirty-two principal places where irrigation has been adopted, is an average of 389 acres for a daily flow of one million gallons of sewage; some of the towns more, some less than this average. The kind of soil best adapted for this purpose has already been considered; but the situation of the proposed sewage farm is also of great consequence. If possible it should be at a lower level than the town, that the sewage may flow to the land by gravitation, and thus avoid the expense of pumping, a process which, even in a sanitary point of view, is not satisfactory. When purchasing land for sewage purposes, authorities would do well to acquire more than is absolutely needed at the time, that provision may be made for the future growth of the town; and besides, by possessing such extra land surrounding a sewage farm, the authorities would protect themselves from the danger of legal proceedings on the score of nuisance. Another reason for making ample provision of land is the fact, that more of it is now used for a given quantity of sewage than was supposed necessary in the early days of sewage irrigation. The surface of the ground must be prepared by laying it out in slopes, the fall of which must vary according to the nature of the soil, being greater in light porous ground than where there is heavy clay soil, that all parts of the surface may get its due proportion of sewage. If the fall is not sharp in porous soils, all the sewage will be absorbed by the portion of soil near the carriers, and two evils will arise—first, the lower portion of the bed will be deprived of its supply of sewage; and, second, part of the sewage will pass so rapidly down through the light soil that it will escape purification. As the absorbing power of heavy clay soils is much slower, then the slope must be much less. It may vary from 1 in 25 in very porous soils, to 1 in 150 where the soil is heavy clay, the object to be attained being that all the sewage must pass through the earth, and that the whole surface of the farm must get its due proportion of sewage. In the case of heavy clay soils, it has been proposed to subject the fluid to a double process of filtration through the earth, by making the water from the drains of one compartment of land flow over another bed of earth, prepared at a lower level, so that the water may pass over it by gravitation. The provision of main carriers and smaller ones passing from these must vary in different localities, and in accordance with the plan adopted, whether catch-water, pane and gutter, or bed system. The compulsory purchase of land for any public purpose is always more expensive than an ordinary transaction, and sewage farms are no exception to this. Indeed, the very purpose for which the land is required is likely to raise the price, as proprietors may not only consider a sewage farm a nuisance in itself, but may dread injury from it to the surrounding land. The preparation of the land, both as regards drainage and levelling, is very expensive—not less than £50 an acre. It has also been found that the working of sewage farms is much more expensive than ordinary farming, one item of the increased expenditure being that the application of the sewage must be constantly supervised and diverted into its proper channel by manual labour. It is very difficult to give an accurate and unbiassed estimate of the cost and results of sewage farming, the accounts of the process even in the same place vary so much as to lead to the conclusion that the reports must be tinctured by the previously held opinions of the reporters. It is no doubt tedious to abound in quotations, still it seems the most impartial way of treating the subject, to bring several authors before my reader. Dr Letheby[1] says of Aldershot: "At the time of our visit, the farm was in a very offensive condition; for although the great bulk of the sewage was not flowing upon the land at all, but running bodily into the Blackwater stream, yet the remains of previous irrigation were lying about in cakes of partially dried fæcal matter, which would be washed away into the nearest streams and ditches by the first heavy shower of rain. The ground, in fact, was everywhere sodden and stinking, and the ryegrass was dying out and the usual rank watergrass taking its place."—P. 4. Dr Letheby took various samples of water, in the analysis of which he remarks: "These results show that the so-called purification of the sewage by irrigation was merely a pretence, for the soluble constituents of the sewage were but little improved by the process, the organic matter of the effluent water being still over twenty grains per gallon, and the amount of suspended matters also considerable. In a sanitary point of view, therefore, the process was highly unsatisfactory; for not only was the sodden sewage ground evolving a most offensive odour, which the inhabitants said was sometimes most sickening, but the effluent water was still a strong sewage, polluting the ditches and water courses to such a degree as to render them a most serious and dangerous nuisance."

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[1] *The Sewage Question.* Baillière, Tindale, & Cox: 1872.

"Considering how highly the Royal Pollution Commissioners had spoken of this Aldershot farm, and of the success of the process, we were not prepared for the shocking condition of things which we witnessed."—Pp. 5–6. Of Banbury he reports—"At the time of our visit in the month of April last, the ground was sodden with sewage, and the side ditches were full of decomposing sewage, the smell from which was very offensive."—P. 7. The analysis of the effluent water was not satisfactory. Of Warwick he says—"The farm was in a sad plight at the time of our visit (April), for the winter frost had killed the grass upon large portions of the fields, and the sewage was running over the ground in a very offensive state."—P. 10. The analysis of the effluent water is unsatisfactory as regards organic matter in solution.

As to the Beddington farm at Croydon, he reports—"The land is at all times in a sodden and offensive condition, and, according to the evidence of Mr Creasy, the surgeon of the neighbouring Orphan Asylum, who practises largely in the district, and of Mr Smee, the eminent surgeon and Fellow of the Royal Society, who has a garden in the locality, the smell is sometimes quite sickening. Mr Creasy, indeed, states that typhoid fever is nearly always present in the houses about the farm, and that all diseases assume a typhoid character, so that medical men speak of the patient as having a sewage tongue."—P. 21.

Of the Norwood Sewage Farm he says—"As might be expected, the ground, which is an impervious clay, is always in a very noisome condition, and the sewage is not sufficiently well purified, except during the times of active vegetation, to be admissible into a running stream; in fact, there are great complaints of the stench of the sewage, and of the effluvium from the irrigated ground by those who reside in the neighbourhood; and the Rivers Pollution Commissioners say in their Report (p. 86) that during frost the purification of the sewage is not at all satisfactory, for they remark that on two occasions when 'the frost was by no means severe yet the organic nitrogen rose from 0·098 to 0·419 per 100,000 parts of effluent water, showing that the removal of offensive nitrogenous organic matter was partially arrested, and indicating that during a severe winter the purification of sewage upon a non-absorptive clay soil may be seriously interfered with;' and on some other occasion, when the effluent water was 'exceptionally impure,' they think it arose from unpurified sewage gaining access to the outfall drains through cracks in the soil. These, in fact, are just the difficulties which stand in the way of the purification of sewage whenever it is distributed upon impervious clay soils, and soils that are liable to crack in dry weather."—Pp. 22–23. Dr Letheby enters at length and in detail into the consideration of the question as to the amount of sewage which ought to be applied to land, and the conclusions at which he arrives are as follows:—" It comes therefore to this, that after an experience of nearly twenty years in every variety of situation, season, and soil, with all the enthusiasm and diligence necessary for success, the so-called practical men are unable to declare definitely what quantity of sewage can be safely and profitably applied to a given area of land, for in active practice it ranges, as we have seen, from 100 tons an acre per annum to 40,000 tons; or, to put it in the form of acreage to the population, it ranges from 2 persons per acre to 800 persons. What further proof is necessary of the difficulties of the whole question, and of the uncertainty of the conditions upon which even a partial success is dependent? One thing, however, is conclusive, and that is the diametrically opposite conditions of sanitary and agricultural success, for while in the one case a limited supply of sewage to the land is necessary, in the other it must at certain times be almost unlimited. To be safe, in fact, as regards freedom from nuisance, the land must never receive more than from 1000 to 1500 tons of sewage per acre per annum, whereas for commercial profit it must never have less than 5000 tons an acre. In the former case it represents a maximum of 30 persons to an acre, in the latter a minimum of 100 persons."—P. 166.

Other writers have been equally severe in their strictures as to surface irrigation. I think it unnecessary to quote from their writings, contenting myself with bringing before the reader the opinion of the late Medical Officer of Health for the City of London. Sewage irrigation has very enthusiastic advocates, and the process has been watched and investigated by various parties, and as it is but right that its advocates should be allowed to state their case, I now give in full an extract from the Report presented to the Local Government Board, headed—

"DETAILS AS TO IRRIGATION BY TOWN SEWAGE.

"As we recommend the application of town sewage to land, we at the same time wish to guard against some extravagant expectations of the agricultural benefits it will confer, which are held and advocated by a few zealous and enthusiastic theorists.

"The continuous application of town sewage to all soils is by no means an unalloyed benefit, as in some cases and seasons, and especially upon clay land, it may be rather injurious than otherwise. Very few crops are actually benefited by the direct application of sewage upon a stiff and retentive soil; indeed, Italian ryegrass, cabbage, and mangold-wurtzel, seem to be the only farm crops that persistently flourish upon any soils, heavy or light, under continual doses of town sewage.

"No growing crop, save natural grass, should be sewaged during the depth of winter, and for potatoes, turnips, most vegetables, and certainly for all pulse and cereals, the land ought rather to be enriched by frequent irrigation in the preceding season than treated with sewage when these crops are growing, except in times of great drought, and even then care is requisite. A very limited experience soon teaches us that the purification of a constant flow of sewage, and which is frequently greatest when least wanted on the farm, must bring certain difficulties in its train. The cultivation of sewaged land, for instance, requires more than double the amount of manual labour which is usually employed upon arable land, and more horses must be kept than upon an ordinary farm. The amount of capital, even where the produce is sold off as soon as grown, must be greatly in excess of that required for the general ordinary cultivation of the soil, while to properly stock and work a sewage farm upon which the main produce is consumed, quite five times the usual amount of money will be needed. One of the greatest difficulties is to keep the sewaged land clean, as not only does every seed and the minutest portion of a root-weed grow, but sewage itself often contains the seeds of numerous weeds which have been washed down from the fodder and straw of stables and cow-houses in towns.

"There can be no doubt now, after the experience of some years, that the land best adapted for sewage irrigation is a warm friable loam. The only instance in which town-sewage irrigation is a decided financial success, is that of the Craigentinny Meadows, at Edinburgh. These meadows are, however, in reality, for the most part only a deposit of sea-sand washed and blown from the adjoining estuary, and the main produce grown is nothing more nor less than luxuriant couch-grass. The enormous amount of coarse forage which is produced from such a naturally sterile soil shows the fertilizing properties of town sewage, and also points still more distinctly to the fact that a sewage farm should consist of land through which the sewage can readily filter. It is strange that although deluges of crude town sewage have been poured upon portions of these Craigentinny Meadows for 200 years, the discoloration of the sandy soil only extends a few inches below the surface, and that at the depth of a foot the sand appears as bright and clean as that upon the adjoining sea-shore.

"It has been contended that if more land is allowed for a given volume of sewage, clay soils, when properly drained, will be equally adapted for town-sewage irrigation. No doubt, if similar volumes of sewage are filtered slowly through a large area of well-drained clay, and quickly through a small area of sand or gravel, a more thorough absorption of the manurial elements from the sewage will be made by the clay than by the porous soil. But clay lands are naturally cold, they dislike wet, and will be at the best only poor filter beds; and when sodden with rain-water, the added sewage is apt to pond on the surface rather than to soak gradually into the already heavily-wetted soils. After heavy dressings of sewage in parching weather, the surface of clay lands may be so baked and case-hardened as considerably to retard the growth of any plant;

and if there is no crop upon the ground the land becomes solidified, and may then be seen coated with a nasty greasy film that is almost impervious to water, or at other times the clay cracks so that the crude sewage passes in small streams directly into the under drains without being even clarified.

"This brings us to consider the various methods of under-draining as practised at different sewage farms we have inspected. In one instance we found that common farm under-drains which had been laid in a retentive soil were being taken up, as the crude sewage too readily found access to them, and flowed out unpurified. Upon another sewage farm some stiff clay land which had been recently drained six feet deep was so cracked by heat and drought that the sewage flowed from the surface into the drains without effecting any practical irrigation; and although intercepted and brought to the top again, the sewage as rapidly disappeared, and at the land drains outlet the effluent was hardly distinguishable in colour and smell from that of the sewage when first applied to the land.

"There seems no doubt that even the lightest soils should have a few deep under-drains, as at Doncaster and Heathcote Farm, Warwick, so as to prevent the sewage water from lodging in the subsoil. All land of medium staple should be thoroughly under-drained, and clays require the drains to be multiplied, so that the interval between them shall not be more than fifteen feet, and care should be taken that the drains are so formed that no sewage-water can flow vertically into them. To prevent this, upon the top of the drain-pipes a foot of the most retentive portion of the soil should be damped or puddled, and tightly rammed down, so that the sewage-water, after percolating through the subsoil, shall flow horizontally into the drains, and not rush into the drain-pipes through the loose mould or cracked clay directly from the surface.

"As already observed, the chief produce of a large sewage farm, which is to earn the most money, must be Italian ryegrass, because it is a plant which luxuriates in moisture, and feeds with singular avidity upon all kinds of liquid manure, and the quantity of such liquid manure given need only be limited by the means at hand for its ready disposal. But the demand for cut grass is so variable that this is not a very easy task. Ryegrass, even when heavily sewaged, grows most rapidly in wet weather; consequently when there is much rain a greater crop is produced, when it is most difficult to deal with, and as there is at such times a more plentiful supply of similar green food on other farms in the district, the demand for ryegrass of the sewage farm is not so extensive. In a damp season it is next to impossible to make sewage-grown grass into hay, as the soil is sodden with rain-water and sewage, and the young undergrowth of grass so soon springs up that the land must be cleared of the cut grass to enable the next crop to grow, and any removal of the cut grass to other ground for the purpose of making hay, even if a suitable site is conveniently situated, will be very costly. It therefore appears to us, that upon an extensive sewage farm, where a constant demand for all the ryegrass grown cannot be depended on, a machine for making hay by artificial means should be provided.

"Drying heavy crops of sewage-grown grass by artificial heat must, however, be a slow, costly, and tiresome process, and should never be resorted to unless necessity compelled this form of dealing with it, and when it appears to be the only way to prevent the total loss of the crop during continuous wet weather. We believe the best machine for the purpose is one which is the invention of Mr W. A. Gibbs, of Gilwell Park, Essex, to whom the Gold Medal of the Society of Arts was awarded a few years ago for the ingenious apparatus which bears his name.

"The length of time which a plant of irrigated Italian ryegrass lasts, varies considerably. On some farms it has been ploughed up after one year's cropping. On other farms the practice has been to keep it down so long as there is a good plant, and it can be kept free from weeds. By fresh seed being sown among the old plants, Italian ryegrass thus treated has lasted seven or eight years. Its more usual duration is, however, from two to three years, and as there seems to be a common belief that this plant can only produce a certain weight of grass, it may follow that the quicker the growth the more readily the plant will be exhausted.

"It was a matter of pleasure and some surprise to us to find how town sewage benefited two such distinctly different forage plants as Italian ryegrass and lucerne. The latter, it is well known, grows with one deep tap-root, while the ryegrass has a dense mass of fibrous rootlets, which extend upon and over the surface of the land. At Paris the favourite green crop for sewage appeared to be lucerne, which at the time of our inspection seemed to flourish remarkably well under sewage irrigation, and to produce heavy crops of the most valuable provender. The gravelly soil and the warm climate of the district no doubt are particularly adapted for sewage irrigation, and this may be the reason why a direct application of sewage to the growth of vegetables seems to answer better than with us. The culture of Italian ryegrass has only recently been introduced on the Paris sewage farm, but its success is so marked that it may possibly take the place of lucerne as the staple green crop.

"English farmers have by some been considered over-cautious in not embarking their capital in the costly cultivation of sewage farms, but on our inspection of the Paris farms it appeared much more strange to us that so many French cultivators, whose little patches of land intersect the Paris sewage farm, had not all availed themselves of *free use* of the sewage. Many, no doubt, have done so, but it was difficult to comprehend how some of the farmers preferred to grow their miserably small crops when the adjoining land upon which the sewage flowed was producing the most abundant yield.

"It may be quite true that town sewage contains all the manure that most plants require, but as these elements of fertility are dispersed through a volume of water many times greater than any crop can absorb, and certainly much larger than it naturally requires, it follows that the manure is not presented to the plant in the most acceptable form. We have also been assured by a gentleman of vast experience that the long-continued application of sewage to the same land fails to produce the like beneficial effect as when it was first used. It, therefore, appears most desirable that the application of sewage should occasionally be supplemented with some solid manure. Cows are the most suitable and best-paying animals for consuming the produce and manufacturing manure upon a sewage farm, and cows should always form the chief portion of its live stock. The successful management of animals, and the proper cultivation of crops under ordinary circumstances, require a fair amount of intelligence and experience; but successfully to carry out all the details of these matters upon a sewage farm, where there is so little to guide the practical farmer, and so much to confound his past experience and upset his previous calculations, is indeed a hard task. And as most sewage farms are at present under the control of ever-changing town councils and local boards, whose members must as a rule be ignorant of practical agriculture, and whose theories upon the subject may be wild and visionary—is it surprising that such poor returns have hitherto resulted from the application of town sewage to the growth of crops?

"Disappointment has therefore been expressed at the poor financial results of sewage farms. Agriculture is never a specially lucrative business, and during the last few years it is probable that strictly accurate accounts would prove that very little profit has been derived from the ordinary cultivation of arable land. Farms to which town sewage is applied have invariably many unfavourable circumstances to contend with. The rent, except where the local authority has land of its own, is certain to be extravagant; the application of sewage is often too costly; the management is frequently changeable and faulty; and the prejudice against the produce of the farm is, in some districts, obstinate and widespread. But where a fair rent is charged for suitable land, the sewage is cheaply and regularly delivered, and a good market is close at hand, there is no reason to doubt that the return for capital judiciously expended upon sewage farms will produce a higher rate of interest than the money invested by the majority of the tillage farmers throughout the country."

The next number will contain some remarks on the above, and give full particulars as to the results of sewage irrigation at several places.

(*To be continued.*)

Part Second.

REVIEWS.

Habitual Drunkenness and Insane Drunkards. By JOHN CHARLES BUCKNILL, M.D. Lond., F.R.S., Fellow of the Royal College of Physicians, late Lord Chancellor's Visitor of Lunatics. London: Macmillan & Co. 1878. Pp. 103.

THE title of this little book is so important, and the author's name so well known, that we anticipated more satisfaction than we have obtained. Instead of a treatise, we are presented with a bundle of short articles, controversial letters and newspaper communications, which all bear on the subject under discussion, but do so in a disjointed, desultory manner. The author considers that he has been misrepresented—at all events misunderstood—and adopts this mode of at once replying to his assailants and stating his own opinions. In the former purpose he has been successful, we think; in the latter he has partially failed. But our own sentiments are nearer Dr Bucknill's than those which he controverts, and we therefore regret that the plan and composition of the book have placed him at a certain disadvantage.

Every physician must have met with numerous cases in the course of his practice which have suggested the idea that some legislative provision might be made with great advantage for the satisfactory treatment of a certain class of habitual drunkards. Some individuals of both sexes are so excited by drink in various ways, according to the peculiarities of their mental development, that they become dangerous members of society, and injurious to themselves and their families. When not under the influence of stimulants they are trusted and often loveable, but their households are kept in continual anxiety, dreading a fresh and sudden outbreak. Such individuals are in general easily misled; they cannot say *no* to solicitation; the smallest quantity of any stimulant awakens the desire for more, and simultaneously weakens their power of resistance; they are speedily on the downward path to a new frantic revel with all its danger and degradation. This recurs again and again, till even family affection is worn out, and longs for a remedy. What is to be done? If you send the patient in the crisis of the outbreak to an asylum, you will discover in a few days that he is well and quite rational, and that you have done what is illegal. The fit of drunkenness is at an end; he comes out full of indignation, and threatening an action of damages.

The truth is, that nearly in all such cases—we believe that exceptions are very few—there is an undue preponderance of the animal propensities, with a corresponding weakness of the higher sentiments—the animal tendencies stronger than the moral and religious——so that the individual is constitutionally prone to such hurtful and dangerous manifestations, in a variety of forms, whenever the toxic qualities of alcohol have begun to act on the brain

A certain proportion of cases have a hereditary taint of insanity, and are liable to have its manifestations evoked, even although their minds may be highly endowed both intellectually and morally. In such persons undue indulgence in stimulating drink may induce symptoms of insanity infinitely various, and not readily overcome or cured. In dealing with them the physician's course is comparatively clear. He and his coadjutors can conscientiously and safely send them to an asylum, from which they will probably emerge, after an interval, quite sane and ready for returning to their wonted occupations. They and their friends have been taught a lesson. Drink must be avoided. It has been the immediate cause of insanity, when that taint was hereditary, and ready to be developed by many other influences besides the one in question.

We regard the great majority of the first class whom we have described as in general persons of comparatively low type and feeble character. They are much to be pitied on that very account. It is their misfortune. But at the same time we regard them as *vicious*, deserving to be treated as offenders against themselves, against their families, against the commonwealth. The second class, on the other hand, must be regarded in a light somewhat different. They are objects of commiseration too, and not without guilt if they knowingly expose themselves afterwards to the danger of drink; but they are not vicious like the others, and demand tenderness of treatment.

In addition to the two classes thus broadly indicated, another is much spoken of in the present day as exhibiting a form of monomania—an insane craving for drink. Those who recognise its existence call it dipsomania or oinomania. They believe that those who exhibit it are really lunatics, and irresponsible. The disease comes on, we are told, in paroxysms or fits, with intervals intervening of varied length, in different individuals. There may be such cases, but we believe that the vast majority of supposed examples may be embraced in the two classes already described. If we take the patient's own view of his case, we shall believe that the tendency to excess in drink comes on unaccountably; that he hates it; that he cannot help himself; that it subsides in a few days, and may not return for weeks or months. But we doubt the *rationale* given, and think, from what we have seen, that the history is really more commonplace than the unfortunate victim imagines. He is tempted, and yields contrary to his conscience and better judgment; his power of resistance is thereby weakened; he gives way still more readily to the next temptation, and then he is landed in a helpless debauch. Of course, if there is a tendency to insanity in his constitution, the result is more certain, and more rapidly reached. Is it necessary to find an explanation of this experience by instituting a new form or phase of insanity? Is there an analogous mania connected with tobacco smoking, with opium smoking, with snuffing, with licentiousness? The devotees of each of these forms of sensual indulgence pursue them steadily. They do not intermit for a season, unless conscience, prudence, and self-interest lead them to do so, neither do they return to their devotion without an exercise of their will. None of these parties tell us that they hate the supposed indulgence, and cannot understand why they have recourse to it.

We consider this an important question, because there is a feeling at present that such cases of irresponsible monomania are very numerous, and require to be treated in lunatic asylums or institutions of a similar kind specially set apart for them. Some respected members of the medical profession hold strong opinions on the subject, and advocate legislative interference, so as to legalize the confinement of these cases of *dipsomania* in order to their being properly treated or cured. This plan has been tried extensively in America, but, as far as we can gather, without much advantage. It is alien, however, to our British notions in regard to personal liberty, and every one must see that a tremendous responsibility will rest on those who grant certificates of lunacy in such cases, unless in a few very exceptional instances, where the presence of other symptoms of insanity removes all likelihood of a mistake.

This seems to be the view taken by Dr Bucknill, and we think that he has made out a strong case. He agrees with Dr Clouston "that the half of habitual drunkards are fools from the beginning, and the other half become fools by their indulgences; that they are usually facile, sensual, irresolute liars, devoid of the rudiments of conscience, self-control, or true affection;" but while thus admitting a mixture of disease and vice in most cases, he is opposed to the notion, held by some physicians, that "there is only one kind of habitual drunkenness, and that the cases are, one and all, cases of dipsomania, of irresistible, uncontrollable, morbid impulse to drink stimulants."

The practical question of what can be done still faces us; but Dr Bucknill does not contribute much towards its solution. While not very hopeful as to the treatment of drunkards, even when they voluntarily put themselves under restraint, he evidently places his chief reliance on moral and religious influences brought to bear on them by kind, sympathetic, and judicious people. No one can doubt, we think, that these are the principal and primary means to be adopted. But we agree with Dr Arthur Mitchell, in his evidence before the Parliamentary Committee, that such legislation as those contemplate who regard all drunkenness as disease "would not tend to diminish drunkenness, except perhaps by its indirect effect in making the young feel that it is disgraceful ever to be drunk, and a dangerous thing to be often drunk, as that might lead to compulsory work and loss of liberty." We gladly endorse also what he goes on to say:—"In such legislation as is contemplated at present, we are simply mitigating a mischief, the growth of which we have made no well-directed effort to check. *I should like to see it a compulsory part of all education for which the state pays, that the young should be taught that it is their duty to understand the laws by which God governs the world, and to pay a reverential respect to them.*" Were this seriously carried out drunkenness would gradually become more disgraceful, especially among the educated classes; and the legislative measures now contemplated in regard to the sale of stimulants would help in effecting an amelioration in the lower strata of society.

Nervous Diseases: their Description and Treatment. By ALLAN M'LANE HAMILTON, M.D., Fellow of the New York Academy of Medicine; one of the Attending Physicians at the Epileptic and Paralytic Hospital, Blackwell's Island, New York City; and at the Out-Patient Department of the New York Hospital. London: J. & A. Churchill, New Burlington Street: 1878.

THIS is a handsome octavo volume of 512 pages, closely printed, and got up in the usual attractive style of the Messrs Churchill. There are fifty-three illustrations, suitable for their purpose, and neatly executed. The author tells us in his preface, that it has been his object to produce a concise practical book, and we think he has been successful, considering the extent of the subject which he has undertaken. In fact, it is more extensive than the title properly or accurately indicates, embracing—besides what are usually regarded as nervous diseases—inflammatory affections, both acute and chronic, hæmorrhages and tumours, of the cerebrum, cerebellum, medulla oblongata, spinal cord, and nerves, with thrombosis and embolism of the arteries, sinuses, and veins.

The reader may therefore expect information, more or less full and satisfactory, on almost every point connected with the nervous system. We do do not profess to have read the book from beginning to end; but in accordance with the principle *ex uno disce omnes,* we have no hesitation in saying, that reliance may be placed on Dr Hamilton's conscientious performance of his self-assigned task, on his soundness of judgment, and freedom from empiricism.

A systematic work, however useful for reference, and as affording, so to speak, a bird's-eye view of a large subject, generally and almost inevitably lies under a disadvantage when compared with original monographs of recognised value. Those who have read the works of Abercrombie, of Charles Bell, of Marshall Hall, of Trousseau, and others, will desiderate, in a system like this, the freshness, and even the incompleteness which characterized them and gave suggestive foretastes of future discoveries.

The chapter on bulbar diseases, including epilepsy and bulbar paralysis, is deserving of attention. His views of treatment are sensible. After particularizing various remedies for epilepsy, and explaining their probable mode of action, he says: "It is a good plan, I think, to combine the remedies I have alluded to, and I take the liberty of presenting a prescription I have used for several years:—

℞. Strychniæ sulph. gr. i.
R. ext. ergotæ, ℥iss.
Sol. potass. arseniat, ʒii.
Sodii bromidi, ℥iss.
Tinct. digitalis, ʒijj.
Aquæ menth. pip. ad. ℥iv Misce.

Sig. A teaspoonful before eating in a tumblerful of water."

Insanity in Ancient and Modern Life, with Chapters on its Prevention. By Daniel Hack Tuke, M.D. London: Macmillan & Co.: 1878.

Dr Hack Tuke is well-known as an able and learned writer on insanity and kindred subjects, and the present work will no doubt be well received by the profession and the public

The first eighty-four pages treat of the prevalence of the causes of insanity amongst the nations of antiquity. We know that madness has existed in all the times of which we have any record, and that it had much the same train of symptoms as at present. But it is impossible to find out whether insanity was more or less frequent amongst the Egyptians, Hebrews, Greeks, or Romans. In fact such inquiries would have been very difficult had Dr Tuke been able to recreate the whole face of antiquity; and amongst the 600,000 rolls of the Alexandrian library it is probable he would not have found one giving the kind of information contained in the yearly reports of the Commissioners in Lunacy. Thus, though Dr Tuke's erudition is surprising, he is not able to tell us much more than that the usual causes of insanity existed in ancient times to a greater or less extent.

In part second, Dr Tuke treats of insanity in relation to modern life, and here he treads upon surer ground. He considers very carefully the question of the increase of insanity, and after making due allowance for the scantiness of statistics in past times, as well as the incompleteness of those at the present day, he nevertheless arrives at the conclusion that there has been a real increase in the proportion of the insane to the general population.

The third part of the book on auto-prophylaxis, or the self-prevention of insanity, seems to us the most valuable. Here we see the ripe experience of a physician thoroughly acquainted with his subject, and possessed of the necessary judgment in giving and qualifying his advice. We can readily believe that a man might consult a book like this little volume, who would shrink from humiliating himself so far as to make a confession to a physician. It is hard to make advice suit one and all, since what affects one man disagreeably does not perturb another, and custom renders some callous to annoyances which would drive others into a madhouse. But Dr Tuke shows great skill in estimating the force of balancing considerations, and those who consult him will find him a safe and judicious guide. If a man, awakened to the terrible sense that he has a hereditary neurosis, and who has added the fear of being insane to the danger of an inborn proclivity, were to consult some modern works on mental derangement, he would find his alarm increased by a survey of the fatal forces impelling him to his doom. He would be told that free will was a delusion and moral responsibility a chimera, and his only sure escape the annihilation of the grave. Dr Tuke, without denying or disguising the dangers which some men have inherited, takes as his leading axiom the freedom of the will. "I would insist," he writes, "in the strongest possible manner upon the necessity of self-rule or control. If I believed that we are conscious automata, I should have no heart to ask a man to do this. But I believe in no instance is it more important that men should recognise their own will, and the obligation of employing it to control those really automatic tendencies of the mind which often are strikingly characteristic of insanity. That which John Stuart Mill said of character is true, in degree, of tendencies to mental derangement—'What is really inspiriting and ennobling in the doctrine of free will, is the conviction that we have real power over the formation of our own character.' The exercise of volition will always increase its force, and every time persons forcibly control automatic or irregular impulses or acts, they will find it easier to repress them in future. On the other hand, if they yield to them, the will becomes weaker and weaker, and they stand a very good chance of actually becoming 'conscious automata.'"

Dr Tuke shows the diet and regimen by which morbid mental irritability may be soothed and led away in a healthy direction. The chapter upon the importance of diet seems to us rather too short. We should have liked to have had Dr Tuke's opinion upon the effects of tea. It seems to us that this drink, when taken several times a day, often has a decided effect in increasing mental irritability, and thus opening the door to insanity, and that it should be proscribed wherever such tendencies exist.

At page 211 we read: "The large quantity of fat and albuminoid substances in tea makes it a very nourishing article of diet." Tea here is a misprint for cocoa.

On the whole, this is a book which will be found useful, both to the general practitioner and to the intelligent patient, and must increase Dr Hack Tuke's reputation, both as a physician, a philosopher, and a scholar.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LVII.—MEETING IX.

Wednesday, 5*th June* 1878.—Professor SANDERS, *President*, *in the Chair*.

EXHIBITION OF PATHOLOGICAL SPECIMENS.

I. *Mr Bell* showed an interesting pathological specimen, viz., the BONE REMOVED IN EXCISION OF THE RADIO-ULNAR JOINT. Although it had been already done in a case of dislocation, this was the first recorded instance of its performance for disease. The patient was a strong young girl, in whom extension and flexion of one arm at the elbow were limited, and pronation and supination entirely gone. The disease was accordingly confined to the radio-ulnar joint alone. In the operation he first made a free incision, and raised the soft parts alone with the periosteum. By means of the chisel and mallet he then cut through the neck of the radius. Esmarch's bandage was applied before the operation began, and antiseptics were used throughout. Two days after the operation the patient was well, and could flex and extend the arm freely. The operative part of the procedure was rendered possible only by the mallet and chisel. As they would see, the head of the radius was nearly absorbed.

II. *Dr Kirk Duncanson* showed—1. HELMHOLTZ'S MODEL OF THE MECHANISM OF THE OSSICLES OF THE EAR; 2. TWO POLYPI, one a mucous polypus, the other probably an organized blood clot; 3. LARGE MODEL OF EAR; 4. Prof. A. M. MAYER'S DYNAMIC APPLICATION OF FOURIER'S THEOREM.

EXHIBITION OF PATIENTS.

I. *Mr Bell* showed a PATIENT, who had made a remarkable recovery from a most serious injury. His thigh had been run over by a crowded Stockbridge 'bus weighing about 2¼ tons. The leg was greatly swollen, the adductor muscles torn across, the femoral vein ruptured, and an immense quantity of blood effused. He laid open this swelling with antiseptic precautions, and although the skin sloughed, the patient had made a most excellent recovery. He could now, as they saw, walk well, but had lost a little of his balancing power, owing to the injury to one of the legs of the muscular tripod of the thigh, formed by the adductors, extensors, and flexors.

II. *Dr Byrom Bramwell* then read a paper entitled CASES OF INTRA-CRANIAL TUMOUR, which appeared at pages 141 and 308 of this Journal.

The *President* thought the members were greatly indebted to Dr Bramwell for his interesting cases. They gave great material for reflection and remark.

Dr Argyll Robertson felt they were all indebted to Dr Bramwell for this among other interesting communications to the Society. All the cases were good, and showed, among other things, the value of the use of the ophthalmoscope in suspected intra-cranial disease. At present, considerable doubt had been thrown on the value of optic neuritis in the diagnosis of intra-cranial disease, and cases had been recorded where optic neuritis existed without any intra-cranial disease being present. Such cases were, however, very rare, and in almost every instance where double optic neuritis was present they would find intra-cranial disease. Even if in double optic neuritis the case terminated favourably, they were not warranted in saying that there had been no intra-cranial disease, as it might have been some gummatous or inflammatory effusion which had become absorbed.. They might have serious intra-cranial mischief without optic neuritis, but such cases, at any rate where there was increased intra-cranial pressure of considerable duration, were also rare. Some of Dr Bramwell's cases were interesting, as showing that optic neuritis might exist without any great failure of vision. This was because the retina was unimpaired in its central sensitive parts. The passage of impressions was uninterrupted at first until the pressure of the exudation set up atrophy.

Dr Clouston remarked on the daily increasing interest of the subject of brain tumours to the physician and psychologist. He felt obliged to Dr Bramwell for bringing his cases before their notice. He himself had met with more than twelve cases of brain tumour, and as many of syphilitic disease. The symptoms in these cases varied.

About one-half had not been diagnosed nor even suspected during life. It was only when the tumours were large, or in vital parts, that their presence could be ascertained before death. In one case the tumour was the size of a hen's egg, but there had been an absence of symptoms. Symptoms, indeed, in such cases depended not so much on the quality of the tumour as on its position, rapidity of growth, and on whether or not it caused degeneration of adjacent brain tissue. He had noticed in three cases of small tumour severe symptoms not referable to the tumour itself. In one case he believed it was from paralysis of the respiratory centre, as the patient died suddenly, and the heart's action continued after the breathing had stopped. In another the patient died although artificial respiration was kept up. He was specially interested in the mental phenomena. Dr Bramwell had noticed a characteristic one, viz., irritability from bad brain nourishment, this being the first mental symptom. The second mania was probably due to sub-inflammatory changes. The last stage was dementia, blindness, etc. In one case of extraordinary brain tumour, a slow-growing sarcoma, he found, on taking off the skull-cap, that the surface of the dura mater was covered with small cauliflower excrescences, from the convolutions pushing their way into the skull-cap. These were portions of brain substance forced through the openings for the veins in the membranes. They had still the structure of brain substance with some inflammatory products. He agreed with Dr Robertson as to the importance of the ophthalmoscope in brain tumour. He would have liked if Dr Robertson had discussed the cause of the optic neuritis. He doubted if one of the tumours exhibited was syphilitic, and he held that, as to treatment, if there was syphilitic inflammation or deposit, they could not give too much iodide of potassium, nor give it too long.

Dr Cadell cordially agreed with the previous speakers in their praise of Dr Bramwell's paper. He was disposed, however, to find fault with the physician's diagnosis of syphilis. No physician had a right to say a tumour was syphilitic simply on the word of a patient. In some of Dr Bramwell's cases there were no concomitant symptom, viz., gummata in liver, and so on. Gummata in the brain were rare. As to the paralysis caused by syphilis he could not speak from personal experience. The paralyses were not general, but local, *e.g.*, of the eye, etc.

Dr Wyllie said that in two cases it was said that there was aphasia and left-sided hemiplegia. He thought it should have been stated whether or not the patients were left-handed.

The President said that one of the most interesting points in the question of cerebral tumours was their bearing on the question of the localization of the functions of the brain. As far as he could gather, Dr Bramwell's cases did not altogether bear out Hitzig and Ferrier's theories of the localization of the functions of the brain,

but rather tended in the opposite direction. Some of the negative results as to function were extraordinary, especially the case of scrofulous tumour occupying the corpus striatum, where there was no paralysis. Such cases were puzzling, and could hardly be explained by supposing that the tumour simply displaced, and did not destroy. There might, indeed, be some compensation. These explanations were, however, only hypothetical, and showed that the difficulty had been felt, but not rightly understood. As to diagnosis, some tumours could be diagnosed, and others could not. The slow-growing came more frequently under the former category. In the latter class the ophthalmoscope helped greatly, and rendered the diagnosis easier than it was thirty years ago. The whole question was a most interesting one, and he hoped that not only would Dr Bramwell pursue his inquiries, but that others in a similar position would give them the benefit of their experience as to diagnosis and locality.

Dr Bramwell thanked the Society for the reception given to his paper, of which he had only given an abstract. The cases would be published *in extenso*, and the question of localization gone into fully. Some of his cases negatived Ferrier's results; others strongly confirmed them. The case Dr Sanders alluded to, in which the right corpus striatum was destroyed, and in which there was no paralysis, seemed to favour the idea that when one striate body in a young subject is slowly and gradually destroyed, its fellow on the opposite side may carry on its functions, or, in other words, that the voluntary movements of both sides of the body may, under such circumstances, be regulated from a single hemisphere. He agreed with Dr Robertson as to the value of the ophthalmoscope, and was interested in Dr Clouston's cases of death from paralysis of the respiratory centre. Fuller particulars would have convinced Dr Cadell that the cases mentioned as syphilitic in reality were such. In answer to Dr Wyllie he had to state that one of the aphasic patients was ambidextrous, the other was right-handed.

1878-9.

We have a desire, as on former occasions, to say something that may be suitable, and perhaps useful, to students of medicine at the beginning of a new session. In order to do this to any good purpose, we must try to place ourselves, if possible, at their standpoint, recalling the thoughts and feelings of a remote past—we shall not say how long ago. Many things are very different now from what they were then; social distinctions and usages are different; all the sciences are cultivated with increasing ardour: new and widening relations are daily discovered betwixt them: education has reached classes of people which, in those old days, were left in the repose of ignorance; and an ambition to rise and to better their condition has seized on many who, forty or fifty years ago, seldom ventured to look beyond the quiet rural scenes where they first drew the breath of life. In short, mental activity is more diffused, the barriers betwixt the various grades of society are rapidly disappearing, and the possibilities, or rather the probabilities, of temporal success are within the reach of many. The special lesson to be gathered from this new condition of things is, that every man, every student, entering on his professional studies will need to do his best, because competition has widened its sphere, and, to say the least, is as intense as it used to be. The competitors are more numerous, and the average standard of preparatory education is undoubtedly higher.

These considerations, although addressed to mere worldly prudence, deserve to be taken into account, because the study on which you are entering is to prepare you for the great business of life, the business in which you are mainly to serve your generation, and do credit to your country. But the healing art, which is henceforward to be your profession, has an intrinsic value and importance, irrespective of all personal, selfish considerations. It endows its votaries with the power of healing, of relieving, preventing, counteracting the numerous bodily diseases and accidents to which human nature is liable; and therefore a tremendous responsibility rests on every one who addresses himself to its cultivation, that he may be so thoroughly master of it as to do his utmost for all the sufferers whom Providence may commit to his care. In some callings, the deficiencies of those who follow them are felt chiefly in the long-run by themselves; but in this calling —the practice of medicine and surgery—ignorance and carelessness involve in a special manner the vital interests of their fellow-creatures. We may mention incidentally, but as worthy of thoughtful consideration, that the well-equipped surgeon or physician deservedly gains an influence with those whose health he has restored or benefited, which will enable him, if so disposed by his own personal convictions, to help them also in their prearations for that better world beyond this scene of trial, where the inhabitant shall no longer say, I am sick."

We say, therefore, to all students of medicine: You have chosen n arduous and a noble calling, and this conviction must dominate, ike a bright particular star, during the whole course upon which you are now entering, not only while attending the schools, but in that after-life for which your present studies are the necessary preparation. Magnify and be proud of your calling from the commencement, and you will be in the fair way to become accomplished and successful practitioners—worthy successors of the many able and honoured men who have shed lustre on our profession.

It may be otherwise in the case of some in the present day, but, according to our own recollection, the young medical student was, as a rule, at the beginning of his curriculum, brought suddenly and unexpectedly face to face with topics for which his previous education and training offered no, or very little, introduction. Hitherto he had to do with languages, chiefly Latin and Greek; he could write and cypher; he had learned the elements of geometry and algebra; he had perhaps attended a course of mechanical philosophy; he had, but this was uncommon, gone a short way into the study of metaphysics and ethics; he had probably read a little in history and biography and travels; but his powers of observation, his "knowing faculties," as Phrenology calls them, had received absolutely no training,—although, of course, we must except that unconscious training which natural bent and occasional opportunity had furnished. When anatomy and chemistry, natural history and botany, and all the outward facts of pathology and surgery were suddenly presented before him, it was like the lifting of a curtain, and the exhibition of new scenes and spectacles almost confusing and incomprehensible. The mental eye required to be educated. Hitherto certain faculties had been employed almost exclusively, and now another set of faculties were prominently called to the front. We do not say that the system was absolutely wrong, for the mind had been so far trained for subsequent thought and investigation; but the education had been one-sided, and there would have been a great advantage secured had more attention been given systematically to the tangible facts and phenomena of external nature.

We have made these observations with the purpose of encouraging those among our readers who are conscious of a similar experience. They now see the *rationale* of their difficulty, and they may understand also how some of their fellow-students, who were possibly dull and dispirited at school, now start forward in the race with unwonted energy, enthusiasm, and progress. Hitherto their weaker faculties were almost exclusively addressed; now their stronger, their powers of observation, which were previously neglected, have met with their appropriate aliment. Let all strive to get the lesson suitable to their individual cases. Those who are confused and overwhelmed, so to speak, by the numerous facts and phenomena abruptly presented to their knowing faculties, hitherto little exercised, should patiently cultivate a habit of close and careful observation, in the firm belief that the initial difficulties will eventually disappear; while those who experience no corresponding disability at the commencement ought to see the importance of employing simultaneously those other mental powers which, at a later period, the exigencies of professional life will certainly demand. The facts mainly require to be mastered in the earlier stages; the comparison of facts, and the weighing of evidence, assume an important place in the subsequent practice of medicine and surgery.

Let the student, then, whether it be anatomy or chemistry that claims his attention, make good use of his eyes. He has suitable manuals, we presume, for both, and therefore there can be little use for written notes of the lecture. If he looks and listens carefully he will get important general impressions fixed in his mind, and can refresh his memory by his books at home; whereas listening and writing, without looking, he runs the risk of learning by rote, without gaining much real information. Sometimes the teacher of anatomy will associate the facts of structure with the comparative anatomy in animals, or, what is more valuable, with surgical details. In that case a mere jotting will be very desirable; one or two suggestive words can be afterwards extended, and will then constitute a professional article of value that will never be lost. It may be added, that when you have at any time in the dissecting-room made a satisfactory dissection of a part or region of the body, important from its surgical or medical relations, a carefully-executed drawing, if you have a turn that way, will not only imprint it on your mind for the time, but prove a valuable record for future use. No plates, however artistic, can ever equal in importance personal sketches thus executed in the days of your youthful enthusiasm.

Before leaving the subject of anatomy, we may allude to the circumstance that some students regard it, at least in its practical part, with a feeling of repulsion almost amounting to disgust. That there should be some feeling of the kind, when the human frame is first contemplated in such humiliating circumstances, is not unnatural, and we do not think the worse of those who experience these sentiments; but it is very important to get over them as speedily as possible, because student days are short, and anatomy is *essential*, and takes long to be mastered. If the repugnance seems invincible, let the study of medicine be abandoned. We fear that the tendency of not a few is directly the opposite, and that the human form divine is sometimes treated with an unseemly irreverence. This, however, does not imply familiarity with it in the best sense, or large attainments in scientific knowledge. The great anatomists have usually been men of sober and reverent minds.

In accordance with the systematic purpose of cultivating the observant faculties, the young student can hardly be too early in his attendance at the hospital, if that can be given without interfering with his other more immediate duties and occupations. A great amount of information can be got in this way, even although it be at the time imperfect. The eye becomes accustomed to many things, so that when the right time comes for special devotion to surgery, the work will appear less strange, and even more congenial, than it would otherwise be. But we repeat that present duties must be conscientiously performed, and nothing, however interesting, must be allowed to displace them.

At a period somewhat later, when a dressership in the surgical wards has been obtained—an appointment at which every one should aim from the beginning—there are invaluable opportunities presented for acquiring knowledge. And here again, "eyes or no eyes?" will assert itself as a vital question. There are innumerable things to be observed, and lessons to be learned. The teaching of the systematic course of surgery is now verified, vitalized, so to speak, and tested by his own observations, by the clinical remarks of the surgeon in attendance, and by the manifest results of treatment. Moreover, there is an invaluable field opened for the acquisition of many qualifications nearly as important as mere surgical skill. He has now come into close contact with suffering human nature, and ought to learn to feel and sympathize with it, making due allowance for weaknesses and infirmities of behaviour and temper engendered by pain and confinement. Let him notice the bearing of his superiors towards the patients, and learn gentleness, kindness, cheerfulness, combined with necessary firmness, as exhibited by them; or, at all events, let him cultivate these desirable qualities, according to his own conscience and good sense, in all his intercourse with the individuals entrusted to his care. We would advise the young student of surgery and of medicine at a subsequent stage to make very special notes of the cases that come under his own care. Everything is to him comparatively fresh and new, and if carefully examined, watched, and noted, will be remembered through life with peculiar vividness. So that facts and circumstances, perhaps neither very notable nor remarkable in themselves, will always continue notable and important to him as forming parts of his education, parts of the training by which his faculties were whetted for future and more effectual service.

A single word on professional reading: During your student-days, while your curriculum has not reached its termination, there will be little time for the perusal of any books beyond those employed in your several classes; but keep always in mind the extreme importance and value of those standard monographs and memoirs which are, as it were, milestones along the course of professional knowledge and attainment. Do not rest satisfied with knowing the results of former labour, the present state of received opinion as taught in your classes and text-books; make yourselves familiar with the successive stages leading up to it, and with the eminent painstaking men with whose names these are identified. In this way only will your knowledge be sufficiently secure to admit of your advantageously, or even safely, plunging into the current, so rapid in these days, of professional and periodical literature. This is a subject on which we dwelt at some length two years ago in the October number of this Journal.

The last advice that our present limits admit of is, that the student of medicine should endeavour to be well-educated *all round*. It will be time enough afterward to select his favourite line of practice or of study. Now is the time and opportunity for gaining an acquaintance, more or less intimate, with every branch of his profession. They are important, all of them, and may serve him materially in after-life, even although at present he may deem some of them in a manner superfluous. Let him cultivate breadth of view so long as he can. The day comes to all of us when a tendency to routine and narrowness is ready to creep in. Let us bear in mind that our profession is a noble one, and that its various departments are mutually interlaced, so that the surgeon is all the better for having at one time carefully studied medicine; the physician will often feel the advantage of an earnest surgical training, while both of them will owe part of their efficiency to some knowledge of gynæcology. For a similar reason, and with the view of making himself cosmopolitan and welcome in any circle of society, let the youthful aspirant continue, as time and opportunity permit, to cultivate his mind by a loyal devotion to polite literature and general knowledge.

INFORMATION REGARDING MEDICAL EDUCATION AND EXAMINATIONS.

THE following are the Regulations of the General Medical Council for the Registration of Medical Students:—

I.—PRELIMINARY EXAMINATIONS.

1. That no person be allowed to be registered as a Medical Student unless he shall have previously passed a Preliminary Examination in the subjects of General Education as hereinafter provided.

2. That it be delegated to the Executive Committee to prepare Annually and lay before the Council for Recognition a List of Examining Bodies, whose Examinations fulfil the conditions of the Medical Council as regards General Education.

3. That, for the present, Testimonials of Proficiency granted by Educational Bodies, according to the subjoined list, be accepted, the Council reserving the right to add to, or take from, the list.

N.B.—A Degree in Arts of any University of the United Kingdom or of the

Colonies, or of such other Universities as may be specially recognised from ime to time by the Medical Council, is considered a sufficient Testimonial of Proficiency.

List of Examining Bodies whose Examinations fulfil the Conditions of the Medical Council, as regards Preliminary Education.

(1.) UNIVERSITIES OF THE UNITED KINGDOM.

Oxford.—Examination for a Degree in Arts. Responsions, Moderations, Local Examinations (Senior), Certificate to include Latin and Mathematics. Local Examinations (Junior), Certificate to include Latin and Mathematics, and also one of the following optional subjects:—Greek; French; German; Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

Cambridge.—Examination for a Degree in Arts. Previous Examination. Local Examinations (Senior), Certificate to include Latin and Mathematics. Local Examinations (Junior), Certificate to include Latin and Mathematics, and also one of the following optional subjects:—Greek; French; German; Natural Philosophy, including the Elements of Statics and Hydrostatics.

Durham.—Examination for a Degree in Arts. Examination for Students in their second and first years. Registration Examination for Medical Students. Local Examinations (Senior), Certificate to include Latin and Mathematics. Local Examinations (Junior), Certificate to include Latin and Mathematics, and also one of the following optional subjects:—Greek; French; German; Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

Oxford and Cambridge Schools' Examination Board.—[1] Certificate to include Arithmetic, including Vulgar and Decimal Fractions; Algebra, including Simple Equations; Geometry, First two books of Euclid; Latin, including Translation and Grammar; and one of the following optional subjects:—Greek, French, German, Mechanical Division of Natural Philosophy.

London.—Examination for a Degree in Arts or Science. Matriculation Examination.

Aberdeen, Edinburgh, Glasgow, and St Andrews.—Examination for a Degree in Arts. Preliminary Examination for Graduation in Medicine or Surgery.

Edinburgh.—Examination of (Senior) Candidates for Honorary Certificates under the Local Examinations of the University of Edinburgh.

Glasgow.—Senior Certificate of Local Examination Board of the University of Glasgow, Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German, Natural Philosophy.

St Andrews.—Honours Certificates granted under Local Examinations, Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German, Natural Philosophy.

Dublin.—Examination for a Degree in Arts. Public Entrance Examination.

Queen's University (Ireland).—Examination for a Degree in Arts. Entrance Examination. Examination for the Diploma of Licentiate in Arts. Previous Examination for B.A. Degree.

(2.) OTHER BODIES NAMED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Surgeons of England.—Examination conducted under the Superintendence of the College of Surgeons, by the Board of Examiners of the Royal College of Preceptors.

The Society of Apothecaries in London.—Examination in Arts.

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[1] The *English* is provided for by the following *Resolution* of the Executive Committee, passed 27th October 1876:—

"That, as every Candidate for the Certificate of the Oxford and Cambridge Schools' examination Board is required to answer questions in such a manner as to satisfy the Examiners that he has an adequate knowledge of English Grammar and Orthography, this shall be held as conforming to the requirements of the Medical Council in reference to English Language."

Royal Colleges of Physicians and Surgeons, Edinburgh.—Preliminary Examination in General Education, conducted by a Board appointed by these two Colleges combined.

Faculty of Physicians and Surgeons of Glasgow.—Preliminary Examination in General Education.

Royal College of Surgeons in Ireland.—Preliminary Examination, Certificate to include Mathematics.

Apothecaries' Hall of Ireland.—Preliminary Examination in General Education.

(3.) EXAMINING BODIES IN THE UNITED KINGDOM NOT INCLUDED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Preceptors.—Examination for a First Class Certificate.

The Examiners for Commissions and Appointments in Her Majesty's Service, Military, Naval, and Civil.—Certificate to include all the subjects required by the General Medical Council.

(4.) INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

Universities of Calcutta, Madras, and Bombay.—Entrance Examination. Certificate to include Latin.

M'Gill College, Montreal.—Matriculation Examination.

University of Toronto, Trinity College, Toronto, Queen's College, Kingston, and Victoria College, Upper Canada.—Matriculation Examination.

King's College, Nova Scotia.—Matriculation Examination. Responsions.

Medical College, Halifax, Nova Scotia.—Matriculation Examination.

University of Fredericton, New Brunswick.—Matriculation Examination.

University of Melbourne.—Matriculation Examination, Certificate to include all the subjects required by the General Medical Council.

University of Sydney.—Matriculation Examination.

University of the Cape of Good Hope.—Matriculation Examination.

University of Adelaide.—Matriculation Examination. (Minutes, Vol. XIII., p. 356.)

Codrington College, Barbadoes.—1. English Certificate for Students of two years' standing, specifying the subjects of Examination. 2. Latin Certificate, or "Testamur."

Tasmanian Council of Education.—Examination for the Degree of Associate of Arts, Certificate to include Latin and Mathematics.

Christ's College, Canterbury, New Zealand.—Voluntary Examinations, Certificate to include all the subjects required by the General Medical Council.

South Australia.—South Australian Institute, Adelaide.—Preliminary General Examination: First Class Certificate.

4. That it be recommended to the Licensing Boards not to accept the Certificate of Proficiency in General (preliminary) Education from any of the Bodies, the names of which are contained in the list annually circulated, unless such Certificate testify that the Student to whom it has been granted has been examined in the following subjects:—1. English Language, including Grammar and Composition.[1] 2 Arithmetic, including Vulgar and Decimal Fractions. Algebra, including Simple Equations. 3. Geometry—First two books of Euclid, or the subjects thereof. 4. Latin, including Translation and Grammar.

And in one of the following optional subjects:—Greek. French. German. Elementary Mechanics of solids and fluids, meaning thereby Mechanics, Hydrostatics, Pneumatics, and Hydraulics.

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[1] The General Medical Council will not consider any Examination in English sufficient that does not fully test the ability of the candidate,—*1st*, To write a few sentences in correct English on a given theme, attention being paid to spelling and punctuation as well as to composition. *2d*,. To write a portion of an English author to dictation. *3d*, To explain the grammatical construction of one or two sentences. *4th*, To point out the grammatical errors in a sentence ungrammatically composed, and to explain their nature. *5th*, To give the derivation and definition of a few English words in common use.

Provided always, that an Examination may be accepted as satisfactory that secures, on the part of the Candidate passing it, a sufficient grammatical knowledge of English.

II.—REGISTRATION OF MEDICAL STUDENTS.

7. Every Medical Student shall be registered in the manner hereinafter prescribed by the General Medical Council.

8. No Medical Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council, and has produced evidence that he has commenced Medical Study.

9. The commencement of the course of Professional Study recognised by any of the Qualifying Bodies, shall not be reckoned as dating earlier than fifteen days before the date of Registration.

10. The Registration of Medical Students shall be placed under the charge of the Branch Registrars.

11. Each of the Branch Registrars shall keep a Register of Medical Students according to the subjoined Form:—

Form for the Registration of Medical Students.

Date of Registration.	NAME.	Preliminary Examination and Date.	Place and Date of Commencement of Medical Study, as certified by a Master, Teacher, or Official in a Medical School or Hospital.

12. Every person desirous of being registered as a Medical Student shall apply to the Branch Registrar of the division of the United Kingdom in which he is residing, according to the annexed Form, which may be had on application to the several Qualifying Bodies, Medical Schools, and Hospitals; and shall produce or forward to the Branch Registrar a Certificate of his having passed a Preliminary Examination, as required by the General Medical Council, and evidence that he has commenced Medical Study.

The following pages contain a tabular abstract of the regulations of the various Licensing Boards, as well as a list of the Hospitals, Dispensaries, etc., attached to our Scotch Medical Schools; also the regulations for the Army, Indian, and Navy Medical Services. The space at our disposal does not allow of more detailed information. But, in point of fact, the regulations of all Licensing Boards now correspond much more closely than they used to do, and the regulations of the General Medical Council afford a key to the general requirements of all of them. For special information, application should always be made to the Secretaries of the Licensing Boards; or, in the case of the Universities, recourse may be had to the published Calendars.

The *Preliminary Examinations* are usually held before the commencement, and at the end, of the Winter Session,—viz., in October, March, or April—sometimes also at the end of the Summer Session. The Professional Examinations in Universities are usually after the Winter and during the Summer Sessions; in Edinburgh, however, the first Professional is held in October as well as April. The other Licensing Boards' examinations are held at various periods throughout the year. Special examinations, under circumstances of urgency, can be held at almost any time; but they, of course, entail considerable addition to the expense.

COURSE OF STUDY REQUIRED BY THE VARIOUS BOARDS OF THE UNITED KINGDOM.

	Age.	Anatomy.	Dissections.	Chemistry.	Practical Chemistry.	Materia Medica.	Physiology or Institutes of Medicine.	Surgery.	Practice of Medicine.	Midwifery.	Medical Jurisprudence.	Pathology or Morbid Anatomy.	Botany.	Natural History.	Practical Pharmacy.	Clinical Surgery.	Clinical Medicine.	Hospital Attendance.	Practical Midwifery.	Dispensary or Out-door Practice.	Vaccination.
	Years.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	
Edinburgh University, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	3 mo., or 6 cas.	6	
University of Glasgow, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	do.	6	
University of Aberdeen, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3		3	3	3	6	6	24	do.	6	
University of St Andrews, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	do.	6	
London University, M.B.,	21	6	12	6	1 crs	1 crs	6	6	6	1 crs	1 crs	1 crs			1 crs	2 yrs.	2 yrs.	4 yrs.	20 cas.	6	
University of Durham, M.B. & M.D.,	21																				
Dublin University, M.B.,		6	6	6	3	3	3	6	6	6	3		3				9	24	6 mo.		
" " Surgical Diploma,		12	18	6	3	6	18	12	6	6	3		3			27	27	27			
The Queen's University of Ireland, M.D.,		12	12	6	3	6	12	6	6	6	3		3	3	3 mos.	12	12	24	3 mo.		
Royal College of Physicians, London,	21	12	12	6	3	3	12	6	12	3	3	6	3		3		9	24	20 cas.		
Royal College of Physicians, Edinburgh,	21	6	6	6	3	3	6	6	6	3	3	3	3		3	3	6	24	6 cases		
King and Queen's Col. of Phys. Ireland,	21	6	12	6	6	6	6	6	6	6	6		6			6	21	27	6 mo.		
Royal College of Surgeons, London,*	21	12	12	6		3	12*	12	6	3					3	27*	9*	33			Cert.
Royal College of Surgeons, Dublin,	21	18	18	6	6	3	18	18	6	3	3					18	9	27			
Royal College of Surgeons, Edinburgh,	21	12	12	6	3	3	3	6 or 12	6	3	3	3			3	6 or 12	6	24	6 cas.	6	Cert.
Faculty of Phys. and Surgeons, Glasgow,	21	12	12	6	3	3	3	6 or 12	6	3	3				3	6 or 12	6	24	6 cas.		
For Double Qualification by Royal College of Phys. and Surg. of Edinburgh,	21	12	12	6	3	3	3	6 or 12	6 or 12	3	3	3			3	6 or 12	6 or 12	24	6 cas.	6	Cert.
For Double Qualification by Royal College Phys. Edinburgh, and Faculty of Physicians and Surgeons of Glasgow,	21	12	12	6	3	3	6	6 or 12	6	3	3	3			3	6 or 12	12	24	6 cas.		
Apothecaries' Hall, England,	21	12	6	6	3	3	6		12	3	3	6	3		Appr.		27	27	20 cas.		9 mo.
" " Ireland,	21	6	12	6	3	3	6	6	6	6	3		3		Appr.	9	18	27	20 cas.		

English Poor-Law Board.—Candidates for the appointment of Medical Officer are required to be registered under the Medical Act, and must be legally qualified to practise both Medicine and Surgery, in virtue of Diplomas or Licences granted by competent legal authority in England, Scotland, or Ireland.

Information respecting exceptions to these regulations under various circumstances, and other details as to the order in which, according to some Licensing Bodies, the courses should be taken out, etc., must be obtained by consulting the published Charts of the Colleges, etc. Students should apply to the Secretary to each Board which they intend to pass for a detailed copy of its Regulations.

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* Students from the Schools of Scotland are admitted to examination at the Royal College of Surgeons of England, if they have followed the course of study required by the regulations of the Royal College of Surgeons of Edinburgh. Students in Scotland, therefore, are not required to attend more than one course of Physiology, six months Clinical Surgery, six months Clinical Medicine, and twenty-four months hospital.

MEDICAL SCHOOLS OF SCOTLAND, 1878–79.

WINTER SESSION.

UBJECTS.	UNIVERSITY OF EDINBURGH.	SCHOOL OF MEDICINE, EDINBURGH.	UNIVERSITY OF GLASGOW.	ANDERSON'S COLLEGE, GLASGOW.	GLASGOW ROYAL INFIRMARY SCHOOL OF MEDICINE.	UNIVERSITY OF ABERDEEN.	UNIVERSITY OF ST ANDREWS.
tomy, Systematic and actical, with nonstrations.	Professor Turner.	Dr Handyside.	Professor Cleland.	Dr A. M. Buchanan.	Mr H. E. Clark.	Professor Struthers.	...
ysiology, or Institutes Medicine.*	Professor Rutherford.	Dr James.	Professor M'Kendrick.	Dr C. M'Vail.	Mr W. J. Fleming.	Professor Stirling.	Professor Pettigrew.
emistry, and Practical Chemistry.	Professor C. Brown.	Dr Macadam, Mr King, and Mr I. Macadam.	Professor J. Ferguson.	Professor Dittmar.	Dr John Clark.	Professor Brazier.	Professor Heddle.
ateria Medica and Therapeutics.	Professor Fraser.	Dr Moinet.	Professor Cowan.	Dr Morton.	Dr John Dougall.	...	...
Practice of Medicine.	Professor Grainger Stewart.	Drs Muirhead† and Wyllie.	Professor Gairdner.	Dr M. Charteris.	Dr A. Wood Smith	Prof. Smith-Shand.	...
Surgery.	Professor Spence.	Dr Watson.† Mr Chiene. Dr John Duncan. Dr Miller.	Professor Macleod.	Dr Dunlop.	Dr H. C. Cameron.	Professor Pirrie.	...
Midwifery.	Professor Simpson.	Dr Angus Macdonald and Dr C. Bell.	Professor Leishman.	In Summer.	...	Professor Stephenson.	...
Natural Philosophy.	Professor Tait.	...	Professor Sir Wm. Thomson.	Prof. Forbes.	...	Professor Thomson.	Professor Swan.
Natural History.	Professor Sir Wyville Thomson.	Dr A. Wilson.	Professor Young.	...	...	...	Professor Nicholson.
General Pathology.	Professor Sanders.	...	Dr Joseph Coats.	...	Dr Foulis.	Dr Rodger.	...
Clinical Medicine.	Professors Maclagan, Sanders, G. Stewart, and T. R. Fraser.	Drs Balfour,‡ Muirhead, and Brakenridge.	Prof. M'Call Anderson & Physicians of Western Infirmary.	The Physicians of the Royal Infirmary.		Drs Smith-Shand, Beveridge, and Fraser.	...
Clinical Surgery.	Professor Annandale.	Mr Joseph Bell.	Prof. George Buchanan and Sugeons of Western Infirmary.	The Surgeons of the Royal Infirmary.		Drs Pirrie, Ogston, and O. Will.	...

Lectures on the Diseases of the Ear are given in Edinburgh during the Winter Session by Dr Kirk Duncanson.

* This course is equivalent to that given under the name of General Anatomy and Physiology in the English Schools. Special schedules are issued by the London Boards for their Scotch students, which should always be inquired for.

† These are not conjoint courses, but separate ones by the gentlemen named.

‡ This is a joint course.

MEDICAL SCHOOLS OF SCOTLAND, 1879.

SUMMER SESSION.

SUBJECTS.	UNIVERSITY OF EDINBURGH.	SCHOOL OF MEDICINE. EDINBURGH.	UNIVERSITY OF GLASGOW.	ANDERSON'S COLLEGE, GLASGOW.	GLASGOW ROYAL INFIRMARY SCHOOL OF MEDICINE.	Univ of Aber
Practical Anatomy and Demonstrations.	Professor Turner.	Dr Handyside.	Professor Cleland.	Dr A. M. Buchanan.	Mr H. E. Clark.	Prof Stru
Botany.	Professor Balfour.	...	Professor A. Dickson.	...	...	Prof J. M. T
Materia Medica.	Professor Fraser.	*Drs Moinet and Craig.	Professor Cowan and Dr Tennant.	...	...	...
Midwifery.	Professor Simpson.	Drs Keiller,* Underhill, Croom, and Charles Bell.	...	Dr J. G. Wilson.	Dr James Stirton.	—
Medical Jurisprudence.	Professor Maclagan.†	Dr Littlejohn.†	Professor Simpson.	Dr Alexander Lindsay.	Dr William Macewen.	Prof Ogst
Comparative Anatomy.	Professor Turner.	Dr Handyside.	...	...	...	—
Practical Physiology, including Histology.	Professor Rutherford.	Dr James.	Professor M'Kendrick.	Dr M'Vail.	Mr W. J. Fleming.	Prof Stirling
Practical Pathology, including Histology.	Professor Sanders.	...	Dr Joseph Coats.	...	Dr D. Foulis.	Dr Rodg
Practical Chemistry.	Professor Crum Brown.	Dr Macadam, Mr King, and Mr I. Macadam.	Professor J. Ferguson.	Professor Dittmar.	Dr John Clark.	Prof Braz
Operative Surgery.	Professor Spence.	Dr Watson,* Mr Chiene, Dr J. Duncan, Dr A. G. Miller.	...	...	Dr H. C. Cameron.	...
Pathology.	Professor Sanders.	...	...	...	Dr D. Foulis.	...
Mental Diseases.	Professor G. Stewart.	...	...	...	Dr Alex. Robertson.	...
Natural History.	Professor Sir Wyville Thomson.	Dr A. Wilson.	Professor Young.	...	...	...
Clinical Medicine.	Professors Sanders and T. R. Fraser.	Drs Balfour,‡ Muirhead, and Brakenridge.	Prof. M'Call Anderson and Physicians of W. Infirmary.	The Physicians of the Royal Infirmary.		Drs Smith-Sha Beverid and Fra
Clinical Surgery.	Professor Annandale.	Mr Joseph Bell.	Prof. George Buchanan and Surgeons of W. Infirmary.	The Surgeons of the Royal Infirmary.		Drs Pirrie Ogston, a O. Will.

Operative Surgery is taught during the Summer in Edinburgh by Messrs Bell and Chiene and Drs Duncan and Miller, and in Glasgow by Professor Macleod. Instruction in Vaccination is also given at the Royal Public Dispensary, Edinburgh, on Wednesdays and Saturdays at 12, both Summer and Winter, by Dr Husband; at the Faculty Hall, Glasgow, on Mondays at 12, by Dr Dunlop; and at the Royal Infirmary, Glasgow, on Mondays and Thursdays at 12 o'clock, by Dr Tannahill. Medical Psychology and Insanity are taught in Summer by Dr Grainger Stewart and Dr J. B. Tuke in Edinburgh, and in Glasgow by Dr Yellowlees; the Diseases of Children by Dr Peel Ritchie; the Diseases of the Eye by Dr Argyll Robertson in Edinburgh, and by Dr Thomas Reid and Dr Wolfe in Glasgow; the Diseases of the Ear by Dr Kirk Duncanson in Edinburgh, and by Dr J. P. Cassells in Glasgow; and Dental Surgery by Dr J. C. Woodburn in Glasgow.

* These are not conjoint courses, but separate ones by the gentlemen named.

† Dr Ogston delivers his courses only in Winter. Dr Littlejohn gives courses during both the Winter and Summer Sessions. Dr Maclagan also lectures during both Summer and Winter. The Winter Course is chiefly intended for law students, but is open to medical students also.

‡ This is a joint course.

⁂ For additional Summer Courses on special subjects, see the Prospectus of each School.

LIST OF HOSPITALS, DISPENSARIES, ETC., IN CONNEXION WITH THE MEDICAL SCHOOLS OF SCOTLAND.

EDINBURGH.

Royal Infirmary, including **Lock Hospital**. Upwards of 560 Beds. isits daily from 12 till 2 P.M. Physicians—Drs Maclagan, Sanders, and rainger Stewart, Professors of Clinical Medicine; Professor Simpson and Dr ngus Macdonald (for Diseases of Women); Drs G. W. Balfour, Claud Muiread, and D. J. Brakenridge, Clinical Lecturers. Assistant Physicians—Drs ohn Wyllie and James Affleck. Consulting Physicians—Dr D. R. Haldane; r Alex. Keiller (for Diseases of Women). Pathologist, Dr D. J. Hamilton.

Surgeons—Professors Spence and Annandale, Mr Joseph Bell, Dr John uncan, and Mr Chiene. Extra Surgeons, Dr P. H. Watson; Dr Thomas eith (for Ovarian Diseases). Assistant Surgeons, Drs A. G. Miller, P. H. aclaren, and John Bishop. Consulting Surgeons, Dr Dunsmure and Dr illespie. Ophthalmic Surgeons, Mr Walker and Dr Argyll Robertson. ental Surgeon, Dr John Smith.

Convalescent House, Corstorphine. Acting Surgeon, Dr A. G. Miller.

Chalmers Hospital for the Sick and Hurt. 24 Beds for medical and surgical patients. Physician, Dr Halliday Douglas. Surgeon, Dr P. H. Watson.

Royal Maternity Hospital. 36 Beds; about 250 in-patients and 350 out-patients yearly. Consulting Physicians, Drs Moir and Graham Weir. Physicians, Drs Keiller, Ziegler, Professor Simpson, and Dr Halliday Croom. Consulting Surgeon, Dr Dunsmure.

Royal Hospital for Sick Children. 60 Beds; average number of out-patients, about 5600. Consulting Physicians, Sir Robert Christison, Dr C. Wilson, and Dr Graham Weir. Consulting Surgeon, Professor Spence. Physicians, Drs R. Peel Ritchie, J. Linton, J. Dunsmure, jun., and J. Andrews. Extra Physicians, Drs J. Cumming and C. Underhill. Surgeon-Dentist, Dr Smith. Pathologist, Professor Sanders. Ophthalmic Surgeon, Dr Argyll Robertson.

Royal Public Dispensary and Vaccine Institution. About 12,700 patients annually. Medical Officers, Professors Sanders and Spence, Drs Linton, Husband, Andrew, D. Wilson, Moinet, Alex. Sinclair, Gordon, Allan Jamieson, and Cotterill. Physician-Accoucheurs, Drs Keiller and Andrew. Superintendent of Vaccination, Dr Husband. Medical Secretary, Dr Andrew. Clinique daily at 2 P.M. Vaccination on Wednesdays and Saturdays at 12 noon. Apothecary, Mr R. Urquhart.

New Town Dispensary. About 10,000 patients annually. Medical Officers, Drs Cunynghame, Affleck, Cadell, Dunsmure, Wyllie, Underhill, Cumming, Carmichael, Ritchie, Tuke, Playfair, and Montgomerie Bell. Physician-Accoucheur, Dr Angus Macdonald. Superintendent of Vaccination, Dr Affleck. Clinique daily at 2 P.M. Vaccination on Tuesdays and Fridays from 12 to 1.

Royal Asylum for the Insane. About 660 patients. Physician, Dr Clouston.

Eye Infirmary, 6 Cambridge Street, Lothian Road. Surgeons, Benjamin Bell, Esq., F.R.C.S., and Joseph Bell, F.R.C.S. Assistant Surgeon, Dr J. Kirk Duncanson. Open daily at 1 P.M. Average number of patients annually, 900.

Eye Dispensary, 54 Cockburn Street. About 2000 patients annually. Surgeons, Mr Walker, Dr Wilson, and Dr Argyll Robertson. Open Mondays, Wednesdays, and Fridays, at 1 P.M. Clinical instruction during the summer session.

Ear Dispensary of Edinburgh, 17 Thistle Street. Drs T. Keith and Blair Cunynghame, and Mr Chiene. Open Tuesdays at 11.

Ear Dispensary, 6 Cambridge Street, Lothian Road. Surgeon, Dr J. Kirk Duncanson. Open Mondays and Thursdays, from 12 to 1 o'clock.

Dental Dispensary, 38 Cockburn Street. Consulting Surgeon, Professor Spence. Consulting Physician, Dr Sanders. Dental Surgeons, Dr Roberts, Mr Knox Chisholm, Mr Swanson, W. Chisholm, A. Cormack, and Jas. Wight. Daily, 9 to 10 a.m. Average number of patients, 4000 per annum.

GLASGOW.

Royal Infirmary. 570 Beds. Visits daily at 9 a.m. Physicians, Drs M. Charteris, Maclaren, Scott Orr, Wood Smith, and Perry.

Surgeons, Drs Cameron, Morton, Watson, Macewen, and Dunlop. Gynæcologist, Dr Stirton. Aural Surgeon, Dr Cassells. Dental Surgeon, Dr Woodburn. Dispensary Physicians, Drs Mather and Lawrie. Extra Dispensary Physicians, Drs J. W. Anderson, John Weir, and John Dougall. Dispensary Surgeons, Mr Clark and Dr Lothian. Extra Dispensary Surgeons, Dr Whitson, W. J. Fleming, M.B., and Dr Foulis. Vaccinator, Robt. Tannahill, M.D. M. Thomas, M.D., Superintendent.

Western Infirmary. This Hospital contains 200 Beds for Medical and Surgical patients, with Wards for Skin Diseases and Diseases of Women. Physicians, W. T. Gardiner, M.D., T. M'Call Anderson, M.D., James Finlayson, M.D. Diseases of Women, W. Leishman, M.D. Surgeons, George H. B. Macleod, M.D., George Buchanan, M.D., A. Patterson, M.D. Dispensary Physicians, Gavin P. Tennent, M.D., Joseph Coats, M.D., D. C. M'Vail, M.B. Dispensary Surgeons, James G. Lyon, M.D., D. N. Knox, M.D., James Christie, M.D. Extra Dispensary Physician, S. Gemmell, M.B. Extra Dispensary Surgeon, J. C. Renton, M.D. Pathologist, Joseph Coats, M.D. Surgeon for Diseases of the Ear, Thomas Barr, M.D. Medical Superintendent, John Alexander, M.D. Lady Superintendent, Miss E. Clyde. The hour of visit is 9 a.m. Operating days, Wednesday and Saturday. Clinical lectures are given on Tuesdays and Fridays. The Dispensary for out-patients is open daily at 2 p.m.

Lock Hospital. 81 Beds. Medical Officers, Drs James Dunlop and A. Patterson. In-patients, 456.

Lying-in Hospital and Dispensary. 24 Beds; in-patients, 293; out-patients, 937. Consulting Surgeon, Dr George Buchanan. Consulting Physician, Dr J. G. Wilson. Physicians-Accoucheur, Drs R. D. Tannahill and Hugh Miller. Assistant Physicians-Accoucheur, Drs Samuel Sloan and J. W. Anderson. Out-door Physicians, Drs R. T. Paton, R. S. Wallace, W. L. Reid, Alexander Miller, and W. J. Brock.

Royal Asylum for the Insane. About 550 patients. Physician-Superintendent, Dr David Yellowlees. Lectures on Mental Diseases during summer, alternately at the University and the Asylum.

Eye Infirmary. 75 Beds; 508 in-patients; 5032 out-patients annually. Consulting Surgeon, George Buchanan, M.D. Surgeons, Thomas Reid, M.D., and Thomas S. Meighan, M.D. Assistant Surgeons, Henry E. Clark, M.R.C.S., J Crawford Renton, M.B., D. N. Knox, M.B.

Dispensary for Skin Diseases, 63 John Street. Physician, Professor M'Call Anderson. Open Mondays and Thursdays at 4 p.m., for out-door patients. This Institution is in connexion with the Wards for Skin Diseases in the Western Infirmary, to which the more important cases are sent.

Ophthalmic Institution. Consulting Physician, Dr J. S. Cumming. Surgeon, Dr J. R. Wolfe. Acting Physician, Dr Robt. Bell. Assistant-Surgeons, Wm. Pickering, M.B., and N. M. Cluckie. Open daily from 1 to 3 p.m. A Course of Lectures and Clinical Instruction during the winter and summer months.

Glasgow Dispensary for Diseases of the Ear, 241 Buchanan Street. During the Summer Session a Course of Practical Instruction in the Treatment of Ear Disease is given to the Students attending the Clinique. Average number of cases treated, 800 annually. Surgeon, James Patterson Cassells, M.D., M.R.C.S. Lond.

The Hunterian Museum is open to Students of Medicine, for purposes of study, on presenting their matriculation tickets.

ABERDEEN.

Royal Infirmary. Upwards of 300 Beds. Visits daily at 12 o'clock. Physicians, Drs Smith-Shand, Beveridge, and Fraser.

Surgeons, Drs Pirrie, A. Ogston, Will, and Garden. Ophthalmic Surgeon, Dr Davidson. Pathologist, Dr Rodger. Dental Surgeon, Mr Williamson.

General Dispensary, Lying-in and Vaccine Institution. 7000 paients annually. Open daily.

Children's Hospital. Physicians, Drs Stephenson and Garden. Clinical nstruction daily at 11 o'clock.

Lunatic Asylum. Above 300 patients.

Eye Institution, General Dispensary Buildings, Guestrow. Open three days in the week at 2.30 p.m. Clinical Instruction on Diseases of the Eye and the use of the Ophthalmoscope. Average, 600 patients annually.

ARMY MEDICAL DEPARTMENT.

6 WHITEHALL YARD, S.W.

SCHEDULE OF QUALIFICATIONS NECESSARY FOR CANDIDATES DESIROUS OF OBTAINING COMMISSIONS IN THE ARMY MEDICAL DEPARTMENT, WITH EXTRACTS FROM THE REGULATIONS PRESCRIBED BY THE ROYAL WARRANT OF THE 28TH APRIL 1876 (CLAUSE 58, ARMY CIRCULARS, 1876), BY WHICH THE PAY, PROMOTION, AND RETIREMENT OF MEDICAL OFFICERS ARE REGULATED AND DETERMINED.

1. Every candidate desirous of presenting himself to compete for a commission in the Army Medical Department must be 21 years of age and not over 32 years at the date of commencement of the competitive examination. He must produce an extract from the Register of his birth, or, in default, a declaration, made before a magistrate by one of his parents or guardians, giving his exact age. He must also produce a recommendation from some person of standing in society—not a member of his own family—to the effect that he is of regular and steady habits, and likely in *every* respect to prove creditable to the Department if a commission be granted; and also a certificate of moral character from the parochial clergyman, if possible.

2. The candidate must sign a declaration upon honour that both his parents are of unmixed European blood, and that he labours under no mental or constitutional disease, nor has any hereditary tendency thereto, nor any imperfection or disability that can interfere with the efficient discharge of the duties of a medical officer in any climate: also that he does not hold, and has never held, any commission or appointment in the public services. His physical fitness will be determined by a Board of Medical Officers, who are required to certify that the candidate's vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. A moderate degree of myopia will not be considered a disqualification, provided it does not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes exists. The Board must also certify that he is free from organic or other disease, and from constitutional weakness, or tendency thereto, or other disability of any kind likely to unfit him for military service in any climate.

3. Certificates of age, registration of diplomas, etc., and of character, must accompany the declaration when signed and returned.

4. Candidates will be examined by the Examining Board in the following compulsory subjects, and the highest number of marks attainable will be distributed as follows:—*a.* Anatomy and Physiology, 1000; *b.* Surgery, 1000;

c. Medicine, including Therapeutics, the Diseases of Women and Childr 1000; d. Chemistry and Pharmacy, and a practical knowledge of drugs, 1 [N.B.—The examination in Medicine and Surgery will be in part practical, an will include operations on the dead body, the application of surgical apparatu and the examination of Medical and Surgical patients at the bedside.] The eligibility of each candidate for the Army Medical Service will be determin by the result of the examinations in these subjects only. Examinations wi also be held in the following voluntary subjects, for which the maximum number of marks will be—French and German (150 each), 300; Natura Sciences, 300. The knowledge of Modern Languages being considered o great importance, all intending competitors are urged to qualify in French and German. The Natural Sciences will include Comparative Anatomy, Zoology, Natural Philosophy, Physical Geography, and Botany, with special reference t Materia Medica. The number of marks gained in both the voluntary subjects will be added to the total number of marks obtained by those who shall hav been found qualified for admission, and whose position on the list of successfu competitors will thus be improved in proportion to their knowledge of modern languages and natural sciences.

5. After passing this examination, every candidate will be required to attend one entire course of practical instruction at the Army Medical School on— (1) Hygiene; (2) Clinical and Military Medicine; (3) Clinical and Military Surgery; (4) Pathology of Diseases and Injuries incident to Military Service.

The following Extracts from the Royal Warrant of 28th April 1876 (*Clause* 5, *Army Circulars*, 1876) *are republished for the information of Candidates fo Commissions in the Army Medical Department.*

1. The daily rates of pay of the officers of the Army Medical Department shall be as follows:—Surgeon-General £2, after twenty-five years' service £2, 5s., after thirty years' service £2, 7s., after thirty-five years' service £2, 10s.; Deputy Surgeon-General £1, 10s., after twenty-five years' service £1, 12s., after thirty years' service £1, 15s., after thirty-five years' service £1, 17s.; Surgeon-Major, on appointment £1, after five years' service as such £1, 5s.; Surgeon, on appointment £250 a year, after ten years' service 17s 6d. daily. Charge pay: the principal medical officer of an army in the field, consisting of 10,000 men and upwards, £1 daily; of 5000 men and upwards, 15s. daily; of less than 5000, 10s. daily. Or, the principal medical officer of a colony where the number of commissioned officers and enlisted men is 1500 and upwards, 5s. daily.

2. The pay of officers shall be issued monthly in arrear.

3. The relative rank of the officers of the Army Medical Department shall be as follows:—I. A Surgeon-General shall rank as Major-General, according to the date of his commission. II. A Deputy Surgeon-General shall rank as Colonel, according to the date of his commission. III. A Surgeon-Major shall rank as Major, according to the date of his commission; after twenty years' full-pay service as Surgeon and Surgeon-Major, he shall rank as Lieutenant-Colonel, but junior of the latter rank. IV. A Surgeon shall rank as Lieutenant, according to the date of his commission; and, after six years' full-pay service, as Captain according to the date of the completion of such service.

4. The relative rank of these officers shall regulate choice of quarters, rates of lodging-money, servants, fuel and light, or allowances in their stead, detention and prize-money, as well as allowances granted on account of wounds or injuries received in action, and pensions and allowances to widows and families.

5. Forage shall be granted to officers of the Army Medical Department for such number of horses as are necessarily kept by them for duty.

6. Admission to the Army Medical Department shall be by public competition.

7. Every candidate for appointment to the Army Medical Department shall possess two Diplomas or Licences, one to practise Medicine and the other Surgery in Great Britain or Ireland, and be registered under the Medical Act in force at the time of his appointment.

8. A successful candidate, who, having passed through a course of instrucion at the Army Medical School at Netley, in Military Medicine, Surgery, Hygiene, and Pathology, shall have proved, after examination, that he possesses a competent knowledge of those subjects, shall receive a commission as Surgeon for a limited period of ten years' service on full pay. From the date of joining at Netley, and up to that of passing his final examination, a candidate shall receive 5s. a day.

9. On the completion of ten years' commissioned service, unless the Surgeon be specially selected for further employment in the Medical Department of our Army, or, if he be unwilling to continue to serve therein, his services shall be dispensed with, and he shall be entitled to receive, in lieu of all pension or retirement, pension for wounds excepted, the sum of one thousand pounds.

10. A Surgeon of less than ten years' service, disqualified for duty by ill-health, certified by a Board of Medical Officers to have been contracted in and by the Service, may, at the discretion of our Secretary of State for War, be granted half-pay at a rate not exceeding 8s. a day if he have served five years or more, or 6s. a day if he have served less than five years, for a period not exceeding six months at one time.

11. At the expiration of that period of six months, if the Surgeon be able to resume his duties, he shall be entitled to complete his term of ten years' service. If he be unable to resume duty, as certified by a Board of Medical Officers, he shall be allowed, if he have not served five years, a further period of six months, without half-pay; at the expiration of which period, if still unable to resume duty, his services shall be dispensed with.

12. If the Surgeon have served five years on full-pay, and be unable to resume duty as certified by a Board of Medical Officers, his services shall be dispensed with, and he shall be entitled to receive, in lieu of all further pension or pay, pension for wounds excepted, a gratuity at one of the following rates, viz.:—If he shall have completed nine years' full-pay service, £800; if he shall have completed eight years' full-pay service, £700; if he shall have completed seven years' full-pay service, £600; if he shall have completed six years' full-pay service, £500; if he shall have completed five years' full-pay service, £400.

13. If a Surgeon be unable to complete his ten years' service from any cause other than wounds or ill-health, certified by a Board of Medical Officers to have been caused in and by the Service, or reduction of establishment, he shall be allowed not more than six months' leave without pay, after which, if unable to resume duty, his services shall be at once dispensed with, and he shall have no further claim on the Department.

14. If the services of an Officer be temporarily dispensed with in consequence of a reduction of establishment, he shall be granted the rates of half-pay fixed by Article 10 until there be an opportunity of re-employing him, or, if he have served five years, he may retire from the Service with a gratuity according to the rates specified in Article 12.

15. Every year it shall be competent for our Commander-in-Chief, on the recommendation of the Director-General of the Army Medical Department, to select, with the approval of our Secretary of State, a number of Surgeons not exceeding six, who shall be retained in the Service, and shall be promoted after twelve years' service on full-pay to the rank of Surgeon-Major.

16. All promotion from the rank of Surgeon-Major to that of Deputy Surgeon-General, and from the rank of Deputy Surgeon-General to that of Surgeon-General, shall be given for ability and merit upon the selection of our Commander-in-Chief, with the approval of our Secretary of State; and the grounds of such selection shall be stated to us in writing, and recorded in the Department. In all such cases the amount of foreign service shall be expressly stated.

17. A medical officer retiring after full-pay service of twenty-five years and upwards, may, if recommended for the same by the head of his Department, receive a step of honorary rank, but without any consequent increase of half-pay.

18. Good Service Pensions shall be awarded to the most meritorious officers of the Army Medical Department, under such regulations as shall be from time to time determined by us, with the advice of our Secretary of State.

19. Six of the most meritorious officers of the Army Medical Department shall be named our Honorary Physicians, and six our Honorary Surgeons.

20. Medical officers shall have a right to retire on half-pay after twenty years' service. Medical officers of the rank of Surgeon-Major or Surgeon shall be placed on the retired list at the age of fifty-five, and all Surgeons-General and Deputy Surgeons-General at the age of sixty years.

21. Our Secretary of State may, when he shall deem it fit, employ medical officers on the half-pay list in special situations at such rates of pay, in addition to half-pay, as he shall from time to time determine; but such officers shall vacate their appointments on attaining the age of sixty-five years.

22. A medical officer who, having voluntarily resigned his commission, has subsequently been permitted to re-enter the .Department, shall not, except under very special circumstances to be approved by our Secretary of State, be allowed to reckon his former service.

Service on the West Coast of Africa.

23. Services of medical officers upon the West Coast of Africa shall be voluntary.

24. Each year or portion of a year shall be allowed to reckon double towards retirement or towards the gratuities fixed by Articles 9 and 12, but not towards increased pay, provided that the officer shall serve at least twelve months on the West Coast of Africa.

25. For each year's service on the Coast, a medical officer shall be entitled to a year's leave at home, and for every additional period beyond a year he shall have an equivalent extension of leave.

26. Officers who may volunteer for service on the West Coast of Africa shall receive double pay while actually serving on the Coast.

Non-Effective Pay.

27. A medical officer of more than ten years' service placed on half-pay by reduction of establishment, or on the report of a Medical Board in consequence of wounds or ill-health, caused in and by the discharge of his duties, or on account of age (under Article 20), shall be entitled to half-pay in accordance with the following daily rates:—Surgeon-General, after thirty years' service, £1, 17s. 6d.; twenty-five years, £1, 13s. 6d.; twenty years, £1, 10s. Deputy Surgeon-General, after thirty years, £1, 5s. 6d.; twenty-five years, £1, 2s. 6d.; twenty years, £1, 1s. Surgeon-Major, after twenty-five years, £1; twenty years, 16s. 6d.; fifteen years, 13s. 6d.; twelve years, 11s. Surgeons, after ten years, 10s.

28. The rate of half-pay awarded to officers retiring for their own convenience, after twenty years' service on full-pay, under Article 20, shall not exceed one-half of their full-pay at the time of retirement.

29. Every medical officer who shall retire after a service upon full-pay of twenty-five years, shall be granted a rate of half-pay equal to seven-tenths of the daily pay he may have been in receipt of when thus retiring on half-pay, provided he shall have served three years in his rank, or shall have served abroad for ten years in all ranks, or for five years with an army in the field. An officer of twenty-five years' full-pay service, whose service falls within neither of these conditions, shall be entitled to only seven-tenths of the daily pay he was in receipt of prior to his last promotion.

30. Medical officers of twenty years' full-pay service, placed temporarily on half-pay on account of ill-health, may, however, be allowed to retire on permanent half-pay at the rate fixed by Article 27, if after one year on half-pay he shall be reported by a Medical Board to be permanently unfit for further service.

31. In all matters not specially provided for in our present Warrant, the Officers of the Medical Department of our Army shall be subject to the General Regulations for the Departments of our Army. [*N.B.*—The rates of pay, including allowances, while serving in India, will range from 317 rupees (£31, 14s.) to 433 rupees (£43, 6s.) per month, according to length of service.

ARMY MEDICAL SCHOOL.

ROYAL VICTORIA HOSPITAL, NETLEY.

President of the Senate.—Sir William M. Muir, K.C.B., M.D., Director-General of the Army Medical Department.

Members of the Senate.—Sir J. Fayrer, M.D., K.C.S.I., F.R.S., Physician to the Indian Council; Sir Alexander Armstrong, M.D., K.C.B., F.R.S., Director-General Naval Medical Department; The Principal Medical Officer, Royal Victoria Hospital; Surgeon-General T. Longmore, C.B., Professor of Military Surgery; Surgeon-General W. C. Maclean, C.B., Professor of Military Medicine; William Aitken, M.D., F.R.S., Professor of Pathology; F. S. B. F. De Chaumont, M.D., F.R.C.S.E., Surgeon-Major, Professor of Military Hygiene; J. D. Macdonald, M.D., F.R.S., R.N., Professor of Naval Hygiene.

Assistant Professors.—Surgeon-Majors J. H. Porter, W. M. Webb, and F. H. Welch, F.R.C.S.L.

Candidates for Commissions in the Army, Navy, and in the Queen's Indian Service, proceed to Netley after passing the Examination at London. At Netley they attend the Medical and Surgical Practice of the Royal Victoria Hospital, and learn the system and arrangements of Military Hospitals. During four months they attend the lectures given by the Professors and Assistant-Professors, and go through a course of practical instruction in the Hygienic Laboratory and Microscopical Room. The lectures and practical instruction are intended to explain the specialities of Military Medical Practice, attention being directed to gunshot and other wounds, surgical arrangements in the field duringaction and sieges, means of transport, field hospitals, tropical diseases and their means of investigation, service in India and in the various colonies, the sanitary arrangements in peace and war, and the means of carrying out the sanitary regulations. Every opportunity is taken of practising operations on the dead body, and practical points of a like kind.

INDIAN MEDICAL SERVICE.

MEMORANDUM REGARDING THE POSITION OF MEDICAL OFFICERS TO BE APPOINTED TO HER MAJESTY'S INDIAN FORCES.

India Office, March 1878.

1. The regulations are those in force at the present time. They are subject to any alteration that may be determined on.

2. *Passage to India.*—Passage allowance to India on appointment will be given, or a passage provided. When passages are provided on board the Indian troop-ships, a charge for messing will be made at the rate laid down in the Royal Passage Warrant of 1865—viz., 3s. 6d. a day; but, when wine and beer are not included in the mess, and it is so stated on the messing certificate, the daily contribution required will be 2s. 6d. only.

3. All Surgeons who shall neglect or refuse to proceed to India under the orders of the Secretary of State for India within two months from the date of leaving Netley, will be considered as having forfeited their appointment, unless special circumstances shall justify a departure from this regulation.

4. *Pay previous to Embarkation.*—Pay at the rate of 10s. a day will be allowed from date of passing final examination at the Army Medical School, until date of embarkation when a passage is provided, or for a period of two

months when the Surgeon is permitted to make his own arrangements for passage. An advance of two months' pay will also be made on embarkation.

5. *Grades and Relative Rank.*—The grades of Medical Officers in the Indian Military Forces are four in number, viz.:—

1. Surgeon-General, ranking as Major-General, according to the date of his commission.
2. Deputy Surgeon-General, as Colonel according to the date of his commission.
3. Surgeon-Major, as Major according to the date of his commission; and after twenty years' service as Surgeon and Surgeon-Major, as Lieutenant-Colonel, but junior of that rank except for choice of quarters.
4. Surgeon, as Lieutenant according to the date of his commission; and after six years' service as Captain according to the date of the completion of such service.

6. *Promotion.*—A Surgeon is promoted to Surgeon-Major on completion of twelve years' service from date of first commission, subject to his passing the prescribed examination.

7. In cases, however, of emergency, or when the good of the service renders such alteration desirable, it is competent for the Secretary of State for India, on the recommendation of the Viceroy and Governor-General of India in Council, to shorten the period of service above mentioned, in such manner as he shall deem fit and expedient.

8. The examination for promotion may be taken at any time after the Surgeon has served nine or more years.

9. When Surgeons have served the requisite time, they will be examined in the following manner:—

A series of printed questions prepared by an examining board, consisting of the Principal of the Medical College and any two or more of the professors he may associate with himself for the purpose, will be sealed and sent by the Surgeon-General to the principal medical officers of stations where Surgeons may be eligible for examination. It will be the duty of the principal medical officer of the station to deliver the sealed questions to the Surgeons, and to see that they are answered without the assistance of books, notes, or communication with any other person. The answers are to be signed and delivered, sealed, to the Principal Medical Officer, who is to send them, unopened, to the Surgeon-General, together with a declaration from the Surgeon himself, or certificate from a superior medical officer, if there is one, that he has availed himself of every opportunity of practising surgical operations on the dead body.

10. The Surgeon is also required to transmit, together with his answers to the Surgeon-General, a medico-topographical account of the station where he may happen to be at the time, or of some other station where he may have been resident sufficiently long to enable him to collect the necessary information for such a report. Failing this, he will send a medico-statistical report of his charge for a period of at least twelve months.

11. If the examining board is satisfied with the replies to the questions, and the Surgeon-General is satisfied with the certificates and with the medico-topographical or statistical report, the Surgeon will be held qualified for promotion.

12 All promotion from the rank of Surgeon-Major to that of Deputy Surgeon-General, and from the rank of Deputy Surgeon-General to that of Surgeon-General, is given by selection for ability and merit.

13. *Tenure of Office in Administrative Grades.*—The tenure of office of Surgeons-General and Deputy Surgeons-General is limited to five years.

14. Deputy Surgeons-General, if not disqualified by age, are eligible either for employment for a second tour of duty in the same grade, or for employment in the higher grade of Surgeon-General by promotion thereto.

15. Absence on leave in excess of six months on medical certificate, or of four months on private affairs, involves forfeiture of appointment.

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[1] The Surgeon may see this certificate before it is sent to the Surgeon-General.

16. *Pay and Allowances when in India.*— Officers who may hereafter be appointed to the Indian Medical Service will receive pay in India according to the following scale:—

Rank.	Years' Service.	Pay and Allowances per Mensem. R.	A.	P.
Surgeon-Major . .	25	888	12	0
" . .	20	852	3	7
" . .	15	677	6	11
" . .	12	640	14	6
Surgeon . . .	10	410	9	5
" . . .	6	392	5	2
" . . .	5	304	14	2
" . . .	under 5	286	10	0

17. On first appointment they will only come into receipt of Indian pay and allowances from the date of their arrival within the limits of the Presidency to which they have been gazetted. When provided with passages on the troop-ships they draw Indian pay and allowances from date of disembarkation at Bombay.

18. The monthly salaries of the principal administrative and military appointments are fixed at the following consolidated sums:—Surgeon-General, Bengal, Rs. 2700; Madras, Rs. 2500; Bombay, Rs. 2500; Deputy Surgeon-General, Rs. 1800; Surgeon-Major, of twenty years' service and upwards, in charge of Native regiments, Rs. 1000, with Rs. 90 horse allowance in Cavalry regiments; Surgeon-Major in charge of Native regiments, Rs. 800, with Rs. 90 horse allowance in Cavalry regiments; Surgeon, above five years' full-pay service, in charge of Native regiments, Rs. 600, with Rs. 60 horse allowance in Cavalry regiments; Surgeon, under five years' full pay service, in charge of Native regiments, Rs. 450, with Rs. 60 horse allowance in Cavalry regiments.

19. The salaries of other medical appointments in the Civil and Military Departments are consolidated, and vary from Rs. 1800 to Rs. 400 per mensem.

20. Qualified officers of the Medical Service are also eligible for appointments in the Assay Department. The salaries of these appointments are from Rs. 600 to Rs. 2250 per mensem.

21. A medical officer will, however employed, be restricted to the rate of pay laid down in para. 16, until he shall have passed the examination in Hindustani, known as the "Lower Standard."

22. Surgeons-General and Deputy Surgeons-General, on vacating office at the expiration of the five years' tour of duty, will be permitted to draw *in India* respectively an unemployed salary of Rs. 1200 per mensem in the former, and Rs. 900 in the latter case, for a period of six months from the date of their vacating office, after which they will be placed while unemployed on the following scale of pay:—Surgeon-General, after thirty years' service on full-pay, £2, 5s.; after twenty-five years' service on full-pay, £2, 5s.; after twenty years' service on full-pay, or on promotion should this period of service not be completed, £2; Deputy Surgeon-General, after thirty years' service on full-pay, £1, 14s.; after twenty-five years' service on full-pay, £1, 10s.; after twenty years' service on full-pay, or on promotion should this period of service not be completed, £1, 8s.

23. *Furloughs.*—An officer will be eligible for one year's furlough on the completion of five years' actual service in India, and for an additional year after each subsequent five years' service.

24. While on furlough an officer will receive half the emoluments of his office.

25. No absentee shall draw more than £1000 or less than £250 per annum.

26. Upon certificate of a Medical Board, an officer not entitled to furlough

if he has served not less than two years in India, may receive it for any period not exceeding two years.

27. Surgeons under six years' service, and in receipt of Indian allowances as subalterns, on returning to England on sick certificate receive passage allowance.

28. Officers of the Administrative Grade are entitled during their tenure of appointment to six months' leave of absence on sick certificate, or four months' leave on private affairs.

29. *Retiring Pensions.*—Officers of the Indian Medical Service will be allowed to retire on the following scale of pension, on completion of the required periods of service:—After thirty years' service in India, £550; after twenty-seven years' service in India, £456; after twenty-four years' service in India, £365; after twenty-one years' service in India, £292; after seventeen years' service in India, £220.

30. Time of service for pension will reckon from date of arrival in India. The period of residence at the Army Medical School will reckon as service for the above pension, except in the cases of officers who have gone through the course at Netley as candidates for the British Army or Navy Medical Service.

31. A Surgeon-General after five years' active employment in India in that grade, will be entitled to retire upon a pension of £350 per annum, in addition to that to which he may be entitled under the above scale.

32. A Deputy Surgeon-General will, after five years' active employment in India in that grade, be entitled to retire upon a pension of £250 per annum, in addition to the pension to which he may be entitled under the above scale.

33. In each of the above cases stated in paras. 31 and 32, six months' absence on medical certificate will be allowed to count towards actual service in those grades.

34. A Surgeon-General or Deputy Surgeon-General who has completed his term of service and has reverted to British pay, may reside in Europe, at the same time qualifying for higher pension.

35. With a view to maintain the efficiency of the service, all medical officers of the rank of Surgeon-Major shall be placed on the Retired List when they shall have attained the age of fifty-five years, and all Surgeons-General and Deputy Surgeons-General when they shall have attained the age of sixty-five years. In any special case, where it would appear to be for the good of the service that the officer should continue in employment, he may be so continued, subject in each case to the sanction of the Secretary of State for India in Council.

36. A medical officer retiring after a service of twenty-five years and upwards may, if recommended for the same by the Government of his Presidency, receive a step of honorary rank, but without any consequent increase of pay.

37. Officers compelled to leave the service on account of ill-health, and not entitled to full-pay pension under present regulations, will be allowed the half-pay of their relative rank, as laid down in the Royal Warrant of 10th May 1873:—Surgeon-Major of twenty years' service, ranking with Lieutenant-Colonel, 11s. per day; Surgeon-Major, ranking with Major, 9s. 6d. per day; Surgeon, ranking with Captain, 7s. per day; Surgeon under six years' service, ranking with Lieutenant, 4s. per day; Surgeon under three years' service, ranking with Lieutenant, 2s. 6d. per day. Officers cannot retire *in India* on half-pay (No. 54, 28th February 1865).

38. *Wound Pensions.*—Medical officers are entitled to the same allowances granted to Her Majesty's Indian Military Forces on account of wounds and injuries received in action as combatant officers holding the same relative rank.

39. *Family Pensions.*—The claims to pension of widows and families of medical officers shall be treated under the provisions of such Royal Warrant regulating the grant of pensions to the widows and families of British officers as may be in force at the time being. (The Royal Warrant of 27th December 1870 is the one now in force.)

40. The widows and families of medical officers are also entitled to pensions from the Indian Service Family Pension Fund, to which all Surgeons must, as a condition of their appointment, subscribe from the date of their arrival in India.

NAVY MEDICAL DEPARTMENT.

Admiralty, 9 New Street, Spring Gardens, London, S.W.

REGULATIONS RELATIVE TO THE EXAMINATION OF CANDIDATES FOR COMMISSIONS IN THE MEDICAL SERVICE OF THE ROYAL NAVY.

Candidates for admission to the Naval Medical Service must subscribe and send to the Medical Department, Admiralty, proofs of their qualifications, etc., similar to those required by the Army Medical Department. The regulations and subjects for examination are also similar.

After passing the examination, every candidate will be required to attend one entire course of practical instruction in the Medical School at Netley, on —(1) Hygiene; (2) Clinical and Naval and Military Medicine; (3) Clinical and Naval and Military Surgery; (4) Pathology of Diseases and Injuries incidental to Naval and Military Service.

At its conclusion, the candidate will be required to pass an examination on the subjects taught in the School. If he give satisfactory evidence of being qualified for the practical duties of a Naval Medical Officer, he will be eligible for a commission as Surgeon.

During the period of his residence at the Netley Medical School, each candidate will receive an allowance ot 5s. per diem with quarters, or 7s. per diem without quarters, to cover all cost of maintenance; and he will be required to provide himself with uniform—viz., the regulation undress uniform of a Surgeon, but without the sword.

The full and half pay of Naval Medical Officers is in accordance with the following scale:—Full-pay: Inspector-General of Hospitals and Fleets—On promotion or under twenty-five years' service, £2, 5s.; ditto or above twenty-five years' service, £2, 6s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £2, 10s. Deputy Inspector-General of Hospitals and Fleets—On promotion or under twenty-two years' service, £1, 11s.; ditto or above twenty-two years' service, £1, 12s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 18s. Fleet Surgeon—On promotion or under twenty years' service, £1, 3s.; ditto or above twenty years' service, £1, 4s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 10s. Staff Surgeon—On promotion or under fourteen years' service, 18s.; ditto or under seventeen years' service, £1; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 2s. Surgeon —Under five years' service, 11s.; under eight years' service, 12s. 6d.; under eleven years' service, 14s.; under fourteen years' service, provided he passed his examination for Staff Surgeon while under ten years' service, 15s. 6d.; above fourteen years' service, ditto, 17s. Half-pay: Surgeon —Under five years' service, 6s.; under eight years' service, 8s.; under eleven years' service, 10s.; above eleven years' service, provided he passed his examination for Staff Surgeon while under ten years' service, 11s. Staff Surgeon —On promotion or under fourteen years' service, 11s.; ditto or under seventeen years' service, 13s.; ditto or above seventeen years' service, 14s. Fleet Surgeon—On promotion or under twenty years' service, 16s.; ditto or above twenty years' service, 16s. 6d.; and for each additional year of service 6d. a day more until the maximum is reached—namely, 18s. 6d. Deputy Inspector-General of Hospitals and Fleets—On promotion or under twenty-two years' service, £1, 1s.; ditto or above twenty-two years' service, £1, 2s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 7s. Inspector-General of Hospitals and Fleets—On promotion or under twenty-five years' service, £1, 11s.; ditto or above twenty-five years' service, £1, 12s.; and for each additional year of service 1s. a day more until the maximum is reached—namely, £1, 18s.

PRELIMINARY EXAMINATIONS for the DIPLOMAS of the ROYAL COLLEGES of PHYSICIANS and SURGEONS of EDINBURGH, during the Year 1878-79.

I. The *Preliminary Examination* in *General Education* for the Double Qualification in Medicine and in Surgery conferred conjointly by the Royal Colleges of Physicians and Surgeons, and also for the separate Diploma of each College for 1878-79, will embrace the following subjects:—

1. *English Language*, including Grammar and Composition.
2. *Arithmetic*, including Vulgar and Decimal Fractions.
3. *Algebra*, including Simple Equations.
4. *Geometry;* First Two Books of Euclid.
5. *Latin;* Horatii Carmina, Lib. I.; Salustii Jugurtha.
6. One of the following subjects at the option of the candidate: (1.) *Greek;* (2.) *French;* (3.) *German;* (4.) *Natural Philosophy*, including Mechanics, Hydrostatics, and Pneumatics.

II. In *Latin*, besides translation from one of the books above prescribed, the examination will include grammar, translation of a passage from an unprescribed author, and translation of a passage from English into Latin, the more difficult words being supplied.

In *Greek*, the books prescribed are, Herodotus' History, Book I., and Homer's Iliad, Book II. Besides translation from both these, parsing, derivation of English words from Greek, and translation of a passage from English into Greek are required.

In *French*, the book prescribed is Molière, L'Avare. Parsing and translation from English into French are also required.

In *German*, the book prescribed is Schiller's Wilhelm Tell. Parsing and translation from English into German are also required.

Natural Philosophy, as defined above, corresponds to *Mechanics*, in the preliminary examination of the University of Edinburgh.

III. The examinations will be held on the following days, beginning each day at twelve o'clock:—Monday, 14th October, and Tuesday, 15th October, 1878; Tuesday, 15th April, and Wednesday, 16th April, 1879; and Saturday 12th July, and Monday, 14th July, 1879. On each occasion the subjects of the first day's examination will consist of English, Latin, and Geometry; and those of the second day, of Arithmetic, Algebra, and the optional subjects.

Candidates are required to give in their names to the officer of either College not less than two days prior to the day of examination.

Each candidate shall pay a fee of ten shillings previous to the examination. In the event of the candidate being unsuccessful, he shall be allowed to appear once again for examination without paying a fee; but, for any number of times more than two on which he shall again appear, he will be charged a fee of Five Shillings on each occasion.

IV. The examinations will be conducted according to the following regulations:—

1. The competence of the candidate will be ascertained by means of written exercises. Candidates whose success amounts to a certain minimum will be admitted.

2. Each candidate must bring with him a card having his name, place of birth, and an address that will find him by post distinctly written on it.

3. The exercises on each of the subjects must, in every case, be written on separate papers; and the candidate must attach his signature and his address to each sheet of his written paper, and on the outside when folded, before giving it in to those who superintend the examination.

4. Books must not be employed, nor may assistance be given by one candidate to another, during the examination. Those who violate this necessary rule shall forfeit, although successful, the right to a certificate.

5. The decision of the examiners will be intimated to each candidate as soon as possible. Those who pass the examination will receive certificates to that

ffect. In the case of those who are successful in part of the examination only, he subjects in which they have passed will be recorded, and they will not be again examined in the branch or branches in which they have been successful.

V A certificate of having passed all the required subjects of the above examination, entitles the possessor, on commencing Medical Study, to be registered as a Medical Student in the form required by the regulations of the General Medical Council, and, provided the candidate passes in three books of Euclid, is also admitted *pro tanto* by the Medical Faculty of the University of Edinburgh as an equivalent for the corresponding subjects of their preliminary examination for intending Graduates in Medicine.

A list of Examining Boards in the United Kingdom and in the Colonies, whose certificates are received by the Royal Colleges, on the recommendation of the General Medical Council, as equivalent to the above, will be found in the Appendix to the Regulations of the Colleges.

ALEXANDER PEDDIE, *President Royal College of Physicians.*
PATRICK HERON WATSON, *President Royal College of Surgeons.*

EDINBURGH, 1*st July* 1878

Frequent inquiries having been made as to the exact nature of the Preliminary Examination for the Diplomas of the Royal Colleges of Physicians and Surgeons of Edinburgh, the Secretaries have supplied the following papers, which were given out at the examinations in 1876.

FIRST DAY.—COMPULSORY.

ENGLISH.

The candidate is required:—

1. To write a passage dictated by the examiner, with strict attention to spelling and punctuation.

2. To give the meaning and derivation of at least eight of the following words:—

Interest, Circumstance, Possibility, Demonstration, Disciple, Fidelity, Interposition, Infallible, Intelligence, Description, Unprofitable, Gradually.

3. To give a grammatical analysis of the following sentence:—

> "So, of his gentleness,
> Knowing I loved my books, he furnished me,
> From my own library, with volumes that
> I prize above my dukedom."

4. To write a short essay on either of the two following subjects, viz.:—
"Boat racing," or "International Exhibitions."

[The essay need not exceed a folio page.]

GEOMETRY.

Euclid, Books 1 *and* 2.

1. The angles at the base of an isoceles triangle are equal, and if the equal sides be produced, the angles upon the other side of the base are equal.

2. To construct a triangle of which the sides shall be equal to three given straight lines.

Show where, in the construction, the demand is made that any two of these lines must be the greater than the third.

3. The complements of the parallelograms about the diagonal of any parallelogram are equal to one another.

Prove also any converse.

4. If a straight line be bisected and produced to any point, the rectangle contained by the whole line thus produced, and the part of it produced, together with the square of half the line bisected, is equal to the square of the line made up of the half and the part produced.

5. To divide a given straight line into two parts, so that the rect contained by the whole and one of the parts may be equal to the square of other part.

If the line be 10 feet long, what are the parts?

Euclid, Book 3.

1. To find the centre of a given circle. Prove that the line which joins the middle points of two parallel chords passes through the centre of the circle.

2. If a straight line touch a circle, the straight line drawn from the centre to the point of contact is perpendicular to the line which touches the circle.

3. If from any point without a circle two straight lines be drawn, one which cuts the circle, and the other touches it, the rectangle contained by the whole line which cuts the circle and the part of it without the circle, is eq to the square of the line which touches it.

LATIN.

I.

Translate:—

Caesar, etsi idem, quod superioribus diebus acciderat, fore videbat, ut, si essent hostes pulsi, celeritate periculum effugerent; tamen, nactus equites circiter xxx, quos Commius, Atrebas, de quo ante dictum est, secum transportaverat, legiones in acie pro castris constituit. Commisso proelio, diutius nostrorum militum impetum hostes ferre non potuerunt, ac terga verterunt: quos tanto spatio secuti, quantum cursu et viribus efficere potuerunt, complures ex iis occiderunt; deinde, omnibus longe lateque afflictis, incensisque, se in castra receperunt.

Parse *idem*. Parse *acciderat*. Parse *pulsi*. Parse *celeritate;* compare the adjective from which it is derived; also compare the adverb signifying swiftly. Parse *nactus;* give the third person singular of the imperfect indicative and imperfect subjunctive; also of the future present indicative and of the present subjunctive, and decline these tenses. Compare *longe* and *late*.

Numerical value, 50.

II.

O! mihi praeteritos referat si Jupiter annos;
Qualis eram, quum primam aciem Praeneste sub ipsa
Stravi, scutorumque incendi victor acervos,
Et regem hac Herilum dextra sub Tartara misi;
Nascenti cui tris animas Feronia mater,
Horrendum dictu! dederat, terna arma movenda;
Ter leto sternendus erat; cui tunc tamen omnis
Abstulit haec animas dextra, et totidem exuit armis:
Non ego nunc dulci amplexu divellerer usquam,
Nate, tuo; neque finitimus Mezentius usquam,
Huic capiti insultans, tot ferro saeva dedisset
Funera, tam multis viduasset civibus urbem.

Parse *referat*. Parse *stravi;* give the first person plural of the present indicative, of the pluperfect indicative, and of the imperfect subjunctive. Parse *dextra;* what word is understood after it? Parse *dederat*. Parse *divellerer*. Parse *viduasset*. Numerical value, 50.

III.—*Passage from an unprescribed Author*.

Neque tamen exercitus populi Romani laetam aut incruentam victoriam adeptus: nam strenuissimus quisque aut occiderat in proelio, aut graviter vulneratus discesserat. Multi autem, qui de castris visundi, aut spoliandi gratia processerant, volventes hostilia cadavera, amicum alii, pars hospitem, aut cognatum, reperiebant: fuere item, qui inimicos suos cognoscerent. Ita varie per omnem exercitum laetitia, moeror, luctus atque gaudia agitabantur.

Parse *adeptus*. Parse *occiderat*. Parse *fuere item, qui inimicos suos cognoscerent*. Numerical value, 50.

IV.—*Render in correct Latin the following Passage:*—

When Titus one day recollected, at **pper,** that he had done nothing for **y one** that day, he said, O friends! **-day I** have lost a day. He was a **·ince** of so much easiness and gener**ity,** that he denied no man anything; **d when** he was blamed for it by his **iends,** he replied, that no man ought **go away** sorrowing from an emperor.

Cum Titus quidam dies recordor, in coena, sui nihil quisquam praesto ille dies, dico, O amicus! hodie dies perdo. Sum princeps tantus facilitas et liberalitas, ut nullus quisquam nego; et cum ab amicus reprehendo, respondeo, nullus tristis debeo ab imperator discedo.

Numerical value, 50.

In order to pass, the candidate must have done one or other, but not both, f Nos. I. and II. He must also have done Nos. III. and IV.; and must have btained in all 100 marks.

SECOND DAY.—COMPULSORY.

ARITHMETIC.

1. £100 are laid out in purchasing articles at 17s. 6d. a dozen, which are fterwards sold at 35s. a score. Required the gain on the transaction.

2. Find the cost of 3 qrs. 17 lbs. 13 oz. at $6\frac{1}{2}$d. per oz.

3. If $15\frac{1}{7}$ yards cost $17\frac{1}{8}$s., what is the cost of $\frac{3}{5}$ of a piece which measures 9$\frac{1}{7}$ yards?

4. Reduce the following to their simplest forms:

$$(1.)\quad \frac{4}{7}+\frac{2}{21}+\frac{5}{6}.$$

$$(2.)\quad \frac{4}{7}\times\frac{2}{21}\div\frac{5}{6}.$$

$$(4.)\quad \left(\frac{4}{7}+\frac{2}{21}\right)\div\frac{5}{6}.$$

5. A room, 22 feet long, requires $58\frac{2}{3}$ yards of carpet $\frac{3}{4}$ of a yard broad to cover it. Required the breadth of the room.

6. Find the simple interest of £517 for $2\frac{1}{2}$ years at $3\frac{1}{2}$ per cent.

7. The *hectare* is a square whose side is 100 mètres. Express the hectare in acres—the mètre being 39·37 inches.

8. The pound sterling is worth in Canada 4 dollars 75 cents. Reduce 1000 dollars to pounds.

N.B.—The working of each question, as well as the answer, must be given in full.

ALGEBRA.

1. Add together—

$$\tfrac{1}{2}(2a-3b+4c),\ \tfrac{1}{3}(2b-3a+4c),\ \text{and}\ \tfrac{1}{4}(2c-3b+4a).$$

2. Divide $a^4+8b^2x^2(a^2-2)+16b^4x^4$ by $a^2+4bx+4b^2x^2$.
If $a=1$, the quotient is a complete square; give its square root.

3. Resolve into factors:—

$$(1.)\quad (3x-2)^2-(x-3)^2.$$

$$(2.)\quad (x+y)^2+2(x^2+xy)-3(x^2-y^2).$$

$$(3.)\quad (1+ax)^2-(a+x)^2.$$

4. A cistern would be filled by the influx pipe in 15 minutes, and emptied by the efflux pipe in 17 minutes. How long will it take to fill the cistern when both pipes are open together?

5. Solve the following equations:—

$$(1.)\quad \frac{1}{4x}+\frac{1}{7x}=11.$$

$$(2.)\quad \frac{4x-2}{3}+4y-3=19.$$

$$\frac{8y-6}{13}+9x-7=40.$$

$$(3.)\quad \sqrt{(30+x)}+\sqrt{(10+x)}=10.$$

6. A room is twice as long as it is broad; if you increase the length of th room by 4 feet and its breadth by 2, the area of the floor will be increased 152 feet. Required the dimensions of the room.

7. Find the least common multiple of $2x^2 + x - 6$ and $4x^2 - 4x - 3$.

N.B.—The working of each question, as well as the answer, must be given in f

SECOND DAY.—OPTIONAL.

GREEK.

Translate:—

I. (*Herodotus, Book I.*)

Ἔχοντι δέ οἱ τοῦτον τὸν πόνον πέμψασα ἡ Τόμυρις κήρυκα ἔλεγε τάδε· Ὦ βασι Μήδων, παῦσαι σπεύδων τὰ σπεύδεις· οὐ γὰρ ἂν εἰδείης εἴ τοι ἐς καιρὸν ἔσται ταῦ τελεύμενα· παυσάμενος δὲ βασίλευε τῶν σεωυτοῦ, καὶ ἡμέας ἀνέχευ ὁρέων ἄρχοντ τῶνπερ ἄρχομεν. οὔκων ἐθελήσεις ὑποθήκῃσι τῃσίδε χρέεσθαι, ἀλλὰ πάντα μᾶλλον ἢ ἡσυχίης εἶναι. σὺ δὲ εἰ μεγάλως προθυμέαι Μασσαγετέων πειρηθῆναι, φέρε, μοχθον τὸν ἔχεις ζευγνὺς τὸν ποταμὸν, ἄφες, σὺ δὲ, ἡμέων ἀναχωρησάντων ἀπὸ τοῦ ποταμ τριῶν ἡμερέων ὁδὸν, διάβαινε ἐς τὴν ἡμετ ἐρην. εἰ δ' ἡμέας βούλεαι ἐσδέξασθαι μᾶλλ ἐς τὴν ὑμετέρην, σὺ τωὐτὸ ποίεε. Ταῦτα δὲ ἀκούσας ὁ Κῦρος συνεκάλεσε Περσέων το πρώτους, συναγείρας δὲ τούτους ἐς μέσον σφι προετίθεε τὸ πρῆγμα, συμβουλευόμεν ὁκότερα ποιέῃ. τῶν δὲ κατὰ τωὐτο αἱ γνῶμαι συνεξέπιπτον, κελευόντων ἐσδέκεσθ Τόμυριν τε καὶ τὸν στρατὸν αὐτῆς ἐς τὴν χώρην.

Parse πέμψασα. Parse παῦσαι. Parse εἰδείης. Parse ὁρέων. Parse ὑποθήκῃσι,—give its derivation. Parse πειρηθῆναι. Parse ἄφες. Parse πρῆγμα,—give its derivation.

Numerical value, 50.

Translate:—

II. (*Homer, Ilias, Lib. II.*)

Ὃν δ' αὖ δήμου τ' ἄνδρα ἴδοι, βοόωντά τ' ἐφεύροι,
Τὸν σκήπτρῳ ἐλάσασκεν, ὁμοκλήσασκέ τε μύθῳ·
Δαιμόνι', ἀτρέμας ἧσο, καὶ ἄλλων μῦθον ἄκουε,
Οἵ σέο φέρτεροί εἰσι· σὺ δ' ἀπτόλεμος καὶ ἄναλκις,
Οὔτε ποτ' ἐν πολέμῳ ἐναρίθμιος, οὔτ' ἐνὶ βουλῇ.
Οὐ μέν πως πάντες βασιλεύσομεν ἐνθάδ' Ἀχαιοί·
Οὐκ ἀγαθὸν πολυκοιρανίη· εἷς κοίρανος ἔστω,
Εἷς βασιλεὺς, ᾧ ἔδωκε Κρόνου παῖς ἀγκυλομήτεω
Σκῆπτρόν τ' ἠδὲ θέμιστας, ἵνα σφίσιν ἐμβασιλεύῃ.
Ὣς ὅγε κοιρανέων δίεπε στρατόν· οἱ δ' ἀγορήνδε
Αὖτις ἐπεσσεύοντο, νεῶν ἄπο καὶ κλισιάων,
Ἠχῇ· ὡς ὅτε κῦμα πολυφλοίσβοιο θαλάσσης
Αἰγιαλῷ μεγάλῳ βρέμεται, σμαραγεῖ δέ τε πόντος.
Ἄλλοι μέν ῥ' ἕζοντο, ἐρήτυθεν δὲ καθέδρας.

Parse ἐφεύροι. Parse ἧσο. Parse φέρτεροί,—compare it. Parse πολυκοιρανίη. Parse δίεπε. Decline κῦμα in the singular, dual, and plural. Compare μεγάλῳ.

Numerical value, 50.

III.

Translate into Greek the following passage:—

Diogenes having heard a certain one saying, "Life is an evil," said, "Life is not an evil, but to live evilly, that is an evil."—Numerical value, 50.

IV.

Derive the following words from the Greek:—

Episcopal, Metallurgy, Apocalypse, Genealogy, Prophet, Planet, Misanthrope, Mythology, Ethnology, Polynesia, Apostrophe, Anonymous, Synonymous, Hygrometer, Eulogy, Epitaph, Epidemic.—Numerical value, 50.

[To pass, the candidate must do all the four passages, and obtain 140 marks.]

GERMAN.

1. Translate into English :—

Mein lieber Herr und Ehewirth! Magst du
Ein redlich Wort von deinem Weib vernehmen?
Des edeln Ibergs Tochter rühm' ich mich,
Des vielerfahrnen Manns. Wir Schwestern sassen,
Die Wolle spinnend, in den langen Nächten,
Wenn bei dem Vater sich des Volkes Häupter
Versammelten, die Pergamente lasen
Der alten Kaiser und des Landes Wohl
Bedachten in vernünftigem Gespräch.
Aufmerkend hört' ich da manch kluges Wort,
Was der Berständ'ge denkt, der Gute wünscht,
Und still im Herzen hab' ich mir's bewahrt.
So höre denn und acht' auf meine Rede!
Denn, was dich presste, sieh, das wusst' ich längst.
—Dir grollt der Landvogt, möchte gern dir schaden,
Denn du bist ihm ein Hinderniss, dass sich
Der Schwyzer nicht dem neuen Fürstenhaus
Will unterwerfen, sondern treu und fest
Beim Reich beharren, wie die würdigen
Altvordern es gehalten und gethan.—
Ist's nicht so, Werner? Sag' es, wenn ich lüge!

2. Parse the following phrases, conjugating the verbs :—*Rühm' ich mich; nöchte gern dir schaden; sag es wenn ich lüge!*

3. Give examples from the above passage of verbs with separable and nseparable prefixes. Under what circumstances is the separable prefix eparated from the verb?

4. Translate into German :—

Emperor Otto the Great was feared in all districts (*Land*) of Germany, for ie was severe, and without mildness. He wore (*tragen*) a beautiful red beard, *Bart*), and what he swore by this beard, he made true and unavoidable *unabwendlich*).

NATURAL PHILOSOPHY.

1. State and prove the fundamental property of the lever.

Two weights respectively of 5 and of 10 lbs. are hung at the extremities of straight bar 1 foot long, supposed without weight, where must the fulcrum be placed so that there may be equilibrium?

If the smaller weight descend 1-100th of an inch, how much will the larger ascend?

2. A triangular table, supposed without weight, is supported at its three angles, A, B, C; a weight is placed on it at any point O. Prove that the pressures sustained by the three props at A, B, C are respectively as the areas of the triangles O B C, O C A, O A B.

If O be the centre of gravity of the triangle, prove that the pressures are equal.

3. What is the origin of the force of gravity at the earth's surface? How far will a stone fall by the action of gravity in three seconds?

4. How is the result of the last question affected by the size and weight of the falling body (1) in vacuo; (2) in the air? Give an experimental determination of the pressure of the atmosphere. A vessel contains a quantity of air which weighs eight grains, and exerts a pressure of 17 lbs. per square inch. If three more grains of air be pumped in, what will the pressure become?

5. Explain the law of motion according to which force acts on a body in motion. Apply it to determine the path which a rifle-ball describes.

6. Define specific gravity. A body weighs 10 lbs. in air, and 8¼ lbs. in water. Determine its specific gravity. What will the same body weigh in salt water, whose specific gravity is 1·025?

7. Describe the common pump.

Part Fourth.

PERISCOPE.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By William Craig, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

Hydrate of Chloral in Diphtheria.—Dr R. L. Moore, of Minnesota, writes us:—"I have been in the habit of using a saturated solution of hydrate of chloral in water, as a gargle, in treating this distressing disease, and have found it to be a splendid addition to our remedies. Last year I treated about 140 cases, losing seven of this number. The chloral solution served us well. Order it used as a gargle, or by atomizer, before taking every dose of medicine, and before taking nourishment of any kind."—*Philadelphia Medical and Surgical Reporter,* 17th August 1878.

Butyl Chloral.—Professor Oscar Liebreich, in a lecture delivered on the 18th December 1877, referring to the chemical composition of this substance, pointed out that the name formerly applied to it—croton chloral—was incorrect, and very misleading, as it has no relation to croton-oil, and that it ought therefore to be discontinued. In the human subject, as well as in the lower animals, the first action of the drug is to produce anæsthesia, which begins in the head, and gradually passes to the rest of the body, reflex irritability remaining intact in the limbs some time after it has been abolished in the head. Then follows narcosis, but it is important to observe that anæsthesia in the head and face may be complete before any trace of narcosis manifests itself. Liebreich suggests the use of butyl chloral in operations on the face, in cases where other anæsthetics are contra-indicated. The dose for this purpose is from 1 to 2 grammes (15 to 30 grains). The chief interest of the lecture lay, however, in the remarks made as to the action of butyl chloral on the heart, and the manner of death in fatal cases. In the case of chloral hydrate, the heart is paralyzed, and its action ceases before the movements of respiration come to an end, whereas the reverse holds good in the case of butyl chloral. A fatal dose of that substance attacks the respiratory centre in the medulla oblongata and paralyzes it, while the heart is unaffected, and continues to pulsate for some time after death. To demonstrate this fact Professor Liebreich showed two rabbits, both of which were in a state of complete narcosis, the one from the effects of chloral hydrate, the other from butyl chloral. In the case of the first animal, the thorax was opened just as all respiratory movements ceased. The heart was lying motionless, both ventricles ing dilated and filled with blood. Artificial respiration had no fect in reproducing the cardiac contractions. But, on the other nd, when the thoracic cavity of the rabbit poisoned with butyl loral was opened (at exactly the same stage), the heart was found be beating regularly, and, to all appearance, normally. After out two minutes the beats, which during that period had become ow, ceased. Artificial respiration at once restored the pulsations, nd so long as the rhythmical inflation of the lungs was kept up, e contractions of the heart continued, thus affording an admirable lustration of the views as to the action of the drug which had een enunciated in the course of the lecture. Professor Liebreich lso indicated that this property gave the drug considerable advanage as an anæsthetic for vivisectional purposes, especially in Engand. The lecturer, in conclusion, adverted to the value of butyl hloral in cases of tic douloureux, and advised its administration issolved in glycerine and water rather than in alcohol, in doses of rom 1 to 2 grammes.—*The Lancet*, 20th July 1878; and *Practitioner*, September 1878.

JABORANDI IN BRIGHT'S DISEASE AND ŒDEMA.—In a report from Bellevue Hospital in the New York *Medical Journal*, it is stated that a woman, aged thirty, entered the hospital suffering from acute nephritis, with general œdema and symptoms of uræmic poisoning. The value of the remedy was very decided. Within three days the dropsy had in great part disappeared. In cases of œdema of the lungs decided benefit resulted from the use of the drug, and a sufficient number of cases were under observation to test its value.—*Philadelphia Medical and Surgical Reporter*, 10th August 1878.

ACACIA IN CRACKED NIPPLE.—A simple means recommended by an Italian physician for the relief of cracked nipple, is to powder it repeatedly with pulverized gum-arabic. Immediately after the child has sucked it should be thoroughly dusted over the surface, and the nipple protected from the air.—*Philadelphia Medical and Surgical Reporter*, 10th August 1878.

NITRITE OF AMYL IN TINNITUS AURIUM.—Dr Michael, of Hamburg, has published a *résumé* of twenty-seven cases of tinnitus aurium treated by him with nitrite of amyl. In nineteen of these he has obtained decided success. Two to five drops should be inhaled at a time. The inhalation was continued while the usual symptoms lasted—redness of the face, injection of the vessels of the eye, and stopped when vertigo appeared. With all the patients who were benefited the tinnitus increased during the period of inhalation. With the disappearance of the redness from the face it diminished, and became less than it was before the inhalation. In some cases the improvement only lasted an hour, in others several weeks, but generally it continued from two to ten days. The effect of a second inhalation was more marked than that of the first, provided that it was not repeated too soon. There should be an interval of two days at least. Of course, inhalations would not be applicable in cases of acute local catarrh, nor where the tinnitus was of mechanical origin.—(*L'Union Médicale.*)—*The American Practitioner*, August 1878.

OCCASIONAL PERISCOPE OF DERMATOLOGY.

By W. Allan Jamieson, M.D.. F.R.C.P., Lecturer on Diseases of the Skin, Edinburgh School of Medicine.

An Undescribed Form of Atrophy of the Hair of the Beard.—Dr Duhring describes a case of this nature which seems to differ from any hitherto recorded. It consisted in atrophy of the hair bulb, accompanied by splitting of the hair substance, and causing irritation of the hair follicles. The disease, which had lasted seven years, occurred in a dyspeptic physician, aged 33, and exercised a depressing effect. The localization was peculiar, affecting each side of the chin and along the upper margin of the moustache, the lower part of the moustache and the side whiskers being healthy. The skin of the affected part was slightly reddened and scaly, as if seborrhœa were present. There was more or less itching, and general irritation of the diseased parts, especially when the beard was allowed to grow. The bulbs were in all cases smaller than normal; often smaller than the shaft, this latter being sometimes much thicker than is normal; in others, fine and atrophied. The diseased hair was of a week's growth, and already the free extremities were split up, this splitting even taking place within the follicle. Some hairs were quite loose, others rather firmer, but all could be pulled out without pain. No parasite was found either in the hairs or epithelium. Shaving and epilation alone did good, but these measures had been but irregularly persevered in.—*American Journal of Medical Science*, July 1878.

Scleroderma Universalis.—Dr Madar, of Vienna, gives an account of a case in a girl of 17. After a threatening of the disease, relieved by warm baths, she was seized with shivering, followed by swelling of the principal joints. In two months rigidity of the cheeks set in, which was accompanied by pigmentation of the skin and pain, with tension and immobility of the joints. Eight months after, on 6th May 1877, the face had become rigid as marble, the eyeballs, eyelids, and lips alone being movable. The skin was dense and hard over the trunk and extremities, the abdomen and throat retaining their wonted pliancy. The fingers were distorted and fixed, the joints painful, both on pressure and spontaneously, while there were subjective sensations of tension which became pain on movement. While there was anæmia and amenor-

hœa, there was no organic lesion. External treatment alone gave elief; protracted baths, especially those to which pine extract had een added, rendered the skin more pliant and a little motion ossible. Faradization mitigated pain, but massage was injurious. Pericarditis, followed by diarrhœa and exhaustion, terminated her life on 8th October. An autopsy, instituted by Dr Chiari, revealed pleuritic and pericardial adhesions, fatty degeneration of myocardium, with wasting of organs and anæmia. No pathological changes, either macro- or microscopic, were found in the spinal cord or ganglia. The skin contained an excess of pigment, both in the deep part of the rete mucosum and papillary portion of the derma. The reticular part of the cutis seemed thicker than it ought, though its meshes were compressed; there was hypertrophy of the subcutaneous areolar tissue, with disappearance of the fat. The other component structures of the skin were healthy. He regards scleroderma rather as a result of chronic inflammation of the skin than as due to lymphstasis, as held by Kaposi, while Madar considers the essential pathology to be central trophoneurosis; comparing the atrophy of the skin to progressive muscular atrophy.—*Vierteljahresschrift für Dermatologie und Syphilis*, 1878.

GLYCEROLE OF SUBACETATE OF LEAD IN THE TREATMENT OF SOME FORMS OF CHRONIC ECZEMA. — Preparations of lead are probably more useful in eczema than those of zinc, though the latter have been more used in this country. The official solution of subacetate of lead has been long favourably known as valuable in acute eczema. Mr B. Squire advocates the employment of a solution in glycerine in chronic eczema. The solution is known as glycerole of subacetate of lead (Squire). This requires dilution; various strengths from half a drachm to two drachms to the ounce of pure glycerine may be made use of, one drachm to the ounce being the most satisfactory. The form of chronic eczema in which it is useful is "that in which there is, either obviously or substantially a moist and viscid exudation from the skin." It is not applicable to dry eczema, either in its papular variety or when there is plastic thickening merely, or dry-scurfiness with infiltration. By its use the affected skin is kept supple and moderately moist, while it has a further value when spread as a film on the raw skin; the glycerine it contains absorbs the watery secretion on its under, and gives it off again as watery vapour on its free surface, thus to some degree replacing and fulfilling the functions of the epidermis. More cleanly than ointments, it should be applied in moderate quantity about three times a day, the skin before each fresh application of the glycerole being boldly sponged with warm water and soap. From its transparency the eczema seems more inflamed, but this is illusory. It is valuable in eczema of the legs, associated with varicose veins, but when by its use the eczema is alleviated it should be discontinued, the leg kept clean by washing, and dusted with lycopodium, while a well-fitting elastic stocking is worn to reduce the œdema. An ointment can be made by mixing six parts of the glycerole of subacetate of lead and twenty-eight of vaseline, which is also available.—*Essays on the Treatment of Skin Disease.* By B. Squire. No. 2. 1878.

OBSERVATIONS ON AN EPIDEMIC OF RÖTHELN. — **Buchmüller,** at Donawitz, near Leoben, met with 168 cases of German measles, of which 82 were males, and 86 females, chiefly children. 1[illegible] had had measles before. It was interesting to note that nearly all the children attending the same class at school were simultaneously affected. He regards the disease as distinctly contagious, though less so than measles. Inoculation with the blood gave no result.—*Wiener Med. Presse,* 1877.

ECZEMA MARGINATUM OF HEBRA, AS OBSERVED IN AMERICA. —Dr L. D. Bulkley gives, in a paper read before the annual meeting of the American Dermatological Association, held last year, an account of twelve cases of this parasitic disease. The affection seems fairly common in America, but none of his cases assumed the exaggerated features depicted by Hebra. The locality was the same—the genito-crural region, the starting-point being usually the inner surface of the left thigh and the adjacent part of the scrotum, the axillæ being in some instances simultaneously implicated. Itching was constant and far out of proportion to the apparent extent and severity of the eruption. Again, the sharply-defined often elevated border was quite distinct from the margin of a patch of ordinary eczema, which shades off almost imperceptibly into the surrounding healthy skin. The parasite in most cases closely resembled, if it was not identical with, the *trichophyton tonsurans.* (In a case which came under our observation in a gentleman from Lima, the mycelium was unusually broad, the individual pieces larger, and many presented extensive vacuoles.) The parasite is generally easily found; when there is doubt, this may be cleared up by permitting the disease to remain untreated for a short time to allow the mycelium to grow freely in the outer layers of the epidermis. An eczema or intertrigo often pre-exists, on which the parasite takes hold. Dr Bulkley relies for treatment on the use of the strongest solution of sulphurous acid kept in a well-corked bottle, and renewed frequently from a freshly-made specimen. The parts are to be well saturated with it two or three times a day; if too much irritation is produced, it may be discontinued, and zinc ointment or a calamine lotion applied. When again resumed a fresh bottle should be procured, as the irritation may arise from the *sulphurous* acid having undergone a higher oxidation into the *sulphuric.* The itching under its use disappears at once, the disease slowly but entirely vanishes by this means alone.

Part Fifth.

MEDICAL NEWS.

Day-Schools for the Deaf and Dumb.—In the year 1874, e School Board for London undertook, as an experiment, the teachg of dumb children, and appointed the Rev. W. Stainer, who has ad over thirty years' experience in teaching the dumb, as a general uperintendent of this branch of their educational work. Four entres for the education of these children were accordingly ounded in various parts of London; in each case the classes are eld in the class-rooms of previously existing schools, and consist f children between the ages of three and thirteen. The children ttend as day scholars from nine till four, bringing their mid-day eal with them, and are allowed to join their brothers and sisters, he hearing children of the school, during play-hours; this associaion with healthy children is found advantageous to their mental evelopment. They pay the ordinary school fee of twopence a eek. The system of instruction employed by Mr Stainer is a ixed method of training, in which the endeavour has been made to embrace all that is practically useful in every known system, nd in practice much care is taken to ascertain what method is best uited to the requirements of each individual case. One of the first objects aimed at in the training of a dumb child is to open up some means of communication between the child and the outer world; and in the case of a young child, say three years old, it is especially necessary to do this as quickly as possible, as a point of essential importance to the further development of the child's mind. A difficulty is met with in some cases from the children not being brought under the influence of education at an early age; so the first efforts of the mind cannot find outward expression. The teaching is conducted partly on the plan known as the "oral method," and partly by sign representation. Mr Stainer finds the applicability of the oral method limited by the time required to educate by this method alone, and the large amount of individual attention it involves, so that with young children the oral method is too slow in giving them the means of expression. These classes for the dumb have now been in active operation for four years; their value is shown by the increasing number of children brought under education each year. At the Wilmot Street School, Bethnal Green, we lately saw a class of Mr Stainer's pupils; many were bright, intelligent, well-behaved children, who, by their replies to questions, descriptions of objects, and writing, showed manifest signs of mental activity and good training. As such classes can only be formed in limited numbers, and many parents live too far from these schools to bring their dumb children daily, Mr Stainer has founded homes near each school where the children may be boarded at a moderate expense. It is to be hoped that, as these "homes" become more generally known, they will receive the full support which this charitable object and economical management should ensure for them.—*Brit. Med. Jour.*, 14th September 1878.

CORRESPONDENCE.

To the Editor of the Edinburgh Medical Journal.

SIR,—I am sorry to trouble you to correct a statement in the September *Journal*, p. 273, attributed to me. But the importance of the subject will, I hope, form my excuse. I may say that for the erroneous statement I am myself essentially to blame, as the extract was sent to me by the printers, but in consequence of my absence from home, the mistake was allowed to pass unobserved. My statement at the Society should have run thus:—

"Dr Macdonald agreed with Dr Keiller in his principles of treatment. He could not see any advantage to be gained by delaying delivery so soon as the hæmorrhage became distinctly threatening to the mother's life. There was no fear of harm from uterine inertia after induction of premature labour under such conditions, although this had been urged as an objection to speedy delivery. He was glad to observe the same principles of treatment as he had some time ago advocated before this Society, strongly supported and practised by Dr Gaillard Thomas. Even in primiparæ there need be no fear that the cervix uteri would not readily dilate under artificial means, as the bleeding made it much more dilatable than usual. He had lately met with a severe case of partial placenta prævia in which the truth of this statement was established. The patient had bled not much at any one time, but continuously for three days and nights. As the effects of the hæmorrhage, if continued, were beginning to look serious, and as the patient was worn out by frequent but entirely ineffective pains, he (Dr M.) decided to deliver, although the outer os uteri was only dilated to the size of something between a sixpence and a shilling. Barnes's dilatators acted astonishingly well, and the cervix was completely dilated in two and a half hours. He considered it was the duty of every one who had experience of such cases to insist upon the necessity of early delivery, and, for the encouragement of gentlemen who have not seen much of such work, to point out the ease and safety with which delivery is ordinarily effected."

I need hardly say that I never advocated immediate delivery in all cases of placenta prævia, as I was made to say in the minutes. Far from it. I merely advocate early delivery if the symptoms are urgent, as the only wise means of removing danger. Furthermore, I hold, with Dr Duncan, Dr Keiller, and many others, that this method is both safe and easy.—Your obedient servant,

ANGUS MACDONALD.

Part First.

ORIGINAL COMMUNICATIONS.

RTICLE I.—*The Comparative Merits of Animal Vaccination and Arm-to-Arm Vaccination.* By P. M. BRAIDWOOD, M.D.

NIMAL vaccination, like many other important subjects, has itherto excited only transient interest. During the meeting of he British Medical Association in Leeds (28th July 1869, *British edical Journal*, 4th September 1869), two papers were presented n this question, both of them advocating strongly the protection gainst smallpox afforded thus, and each based on the personal xperience of its author. Since that date reference has been made n the medical and lay press of this country, both by correspondence nd otherwise, to the success of animal vaccination, more especially n Belgium. Nor have the authorities in this country, who are esponsible for our national vaccination arrangements, been ndifferent, seeing that since the above date the Privy Council Reports contain the results of an investigation into this question by ne of its medical officers. Still matters remain *in statu quo*, the rm-to-arm method (termed by some the Jennerian method) is the generally practised and authoritatively approved procedure. In the *Brit. and For. Med. Chirur. Review*, April 1870, I stated in an article entitled "Animal Vaccination" the special advantages which seemed to me possessed by "heifer lymph." In the following paragraphs my desire is to draw attention to a pamphlet recently published by Dr Martin of Boston, who has had extensive experience of animal vaccination, and is an ardent advocate of this procedure, and to refer to the debate on vaccination recently held (22d May) before the Metropolitan Counties Branch of the British Medical Association, and reported in the *British Medical Journal* of 22d June 1878.

The brochure before us[1] originated with the appointment in 1876 by the American Medical Association of a committee "to investigate and report upon animal vaccination." Dr Martin, chairman of this committee, assumes "entire and undivided responsibility" for all the statements contained in this report, seeing he was unable by distance of residence to submit the report to the other members of committee. After some prefatory apologetic remarks, Dr Martin proceeds to discuss the question —one of paramount importance—"Whether the virus obtained by the inoculation of bovine animals with the virus of original cowpox, induces the development of *vaccinia* of greater perfection, and, therefore, of probably more protective efficacy than that obtained by the transmission of the same disease on a series of human subjects?" The key-note of all legal enactments, the opposition to such laws, the oft-related results of smallpox epidemics, the origin of anti-vaccination leagues—all include the pith of this query. But the answer to it—a decided and *truthful* answer—is difficult to reach. If the only reliable test, post-vaccinal inoculation with variolous lymph, could be applied, and better, if it could be repeated at intervals of time, indubitable and veritable results would be obtained; but in the absence of such we must draw our inferences as carefully as possible from nature's experiments during smallpox epidemics, and from such indirect data as the *rôle* of phenomena furnished by the several varieties of vaccination and the cicatrices they produce may furnish.

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[1] *On Animal Vaccination*, by H. A. Martin, M.D., Boston, 1878.

An important point stated by our author, and it is one *too* frequently overlooked by vaccinators, is that Jenner always maintained *febrile reaction* to be "the only perfect proof of constitutional affection, and *absolutely essential* to the perfection of the prophylaxis. Without it he pronounced a vaccination merely local and quite or nearly without value." This, moreover, has always been felt to be a drawback attached to the continuous transmission of vaccine lymph through the human subject. To remedy it retro-vaccination (or the transmission of vaccinia through the bovine species at intervals before its transference to man) was strongly advocated, and with this object retro-vaccination is still carried on in Bavaria and some other countries. But the difference of opinion as to the utility of retro-vaccination has failed to encourage an extensive trial of the method.

Animal vaccination, or heifer-transmitted cowpox inoculation, was inaugurated in America during September 1870 by Dr Martin, and in his report we have the observations he has made, and the results at which he has arrived, from a continuous and careful study of this mode of vaccinating since that time. During twenty-five years prior to this date, he had "had constant experience" of the Jennerian method, and after receiving the "animal lymph" from M. Depaul of Paris in September 1870, he continued for some time to vaccinate children with humanized (National Vaccine Institution of England) lymph on one arm and with heifer lymph on the other, so as to detect more exactly the difference of effect in these methods. He was enabled also by the epidemic of smallpox hich spread through various parts of America during 1872–73, to scertain the advantages of animal vaccination over the long-stablished arm-to-arm method.

This leads us to our author's next query, "Does the practice of nimal vaccination offer such advantages over that with long umanized virus, as to justify us in abandoning the latter and lopting the new method?" The reply is derived from a study of e duration of the disease and its regular progression through ertain well-defined stages, from noting the character of the vesicle nd its crust, and from the appearance of the cicatrix remaining. n these respects the effects of both methods are described and mpared. It is well to bear in mind that in studying vaccinia e same rule is applicable as holds good with other diseases, that e changes should be noted *day after day*, and that results rounded on observation of the vaccine vesicle, at intervals of say ight days, are not strictly correct. Dr Martin observes this rule, nd his results are as follow:—Vaccinia, according to the earlier riters on the subject, and as noted by Dr Martin in children accinated with heifer-transmitted cowpox lymph, extends over wenty-one or even thirty-two days, reckoning from the insertion f the virus to the spontaneous fall of the crust. But with the use f long-humanized lymph he observed a great diminution in uration—"The course of the disease induced by this virus obtained from Mr Robert Ceely of Aylesbury in 1859, and later rom the National Vaccination Institution of Great Britain) was sually eleven days from insertion till the crust fell; it was an nusual circumstance for a crust from this vaccination to adhere ill the fourteenth day." Again, animal vaccinia pursued a efinite course, papulation appearing at the end of the third r beginning of the fourth day, the areola commencing at the atter end of the ninth or beginning of the tenth day, the ormation of crust or scab being accomplished on the sixteenth r seventeenth day, and falling off spontaneously about the wenty-fifth. In children vaccinated with humanized lymph he stages of vaccinia were of much shorter duration. These oints are illustrated by a reprint, by the heliotype process, of M. Chazal's illustrations in M. Bousquet's work, and though mperfect as a print, it shows well the characteristics of these wo forms of vaccinia. The crust resulting from animal vaccinia approached very nearly the size of the vesicle, was of a rich dark brown or dark mahogany colour, and when employed for vaccinating children showed great reluctance to affect the human system. Lastly, in the employment of animal vaccination there was observed very decided febrile reaction coincident with the rise, development, and decline of the areola, and the disease resulted in an indelible cicatrix or scar of a peculiar and well-defined type. In these last particulars, also, Dr Martin found vaccination with humanized lymph to be defective, and laying special stress on the characters of a vaccine cicatrix, he has inserted in his repo reprint of Dr D. Decanteleu's illustration in his *Monographie les Cicatrices de la Vaccine.* From several years' experience vaccinating, and from having repeatedly and carefully watch instances of the various forms of vaccinia, I readily endorse D Martin's preference for animal vaccination, and corroborate th accuracy of his observations. Not merely in my own practice, b in that of many others, I have noted this tendency of vaccinia induced by humanized lymph (the Jennerian method) to run a rapid course, the vesicles to be easily ruptured, the crust to be o much smaller size than the vesicles, and to fall off early, and th cicatrix to form a very imperfect mark. The character of th cicatrix is considered by British authorities to be an importan indication of the progress of the disease and of its protective pow against smallpox; but a reference to Dr Martin's footnote (pp. 2 to 31) shows that the definition of a typical cicatrix given in D Seaton's Handbook and in other British works does not agre with that of Dr Decanteleu nor with our author's views. Accordin to these the foveæ (specified by British writers as important) are indicative of an imperfect evolution of the disease, being the remains of sudoriparous ducts, whereas a typical vaccine cicatrix resulting from a constitutional affection and from a thorough local destruction of tissue is a depression showing a "smooth centre surrounded by rays or bands of connective tissue." The production of such a cicatrix is to be understood by reference to the plates accompanying Braidwood and Vacher's *Second Report on th Life History of Contagium,* which show the destruction of tissue induced by vaccinia. It is to be regretted that Dr Martin has not thought fit to give some account of the causes which, according to Dr D. Decanteleu, produced such very different forms of cicatrices.

Statistical evidence in favour of animal vaccination is next given by Dr Martin. During less than seven years he had vaccinated and superintended the vaccination of over 600 animals, and from these over 800,000 charged points and many thousands of crusts and tubes of fluid lymph were issued. Moreover, during the epidemic of 1872–73, he vaccinated and re-vaccinated nearly 12,000 persons. In comparing the results of his re-vaccinations with long humanized lymph and those in which he used heifer-transmitted cowpox vaccine, he obtained, in the former instance, 35 per cent. of successes, and with the latter 80 per cent. Among the latter, "in certainly over 50 per cent. the appearances very nearly approached the typical primary vesicle." Dr Martin's 80 per cent. of successes is a considerably higher average than that given by others who have practised animal vaccination (Dr Warlomont of Brussels states 62 per cent. as being the like average in Belgium), but from our own experience we do not doubt his correctness.

In discussing the alleged disadvantages of animal vaccination as means of protecting human beings, our author specifies four jections which have been raised, and to three of these I shall fer briefly. The possibility of communicating animal diseases to uman beings has been suggested as an objection to animal accination. "A sufficient answer," says Dr Martin, "is that ere is not an authentic record, hardly even an unauthentic one, f a single case of this sort in the whole history of vaccination." But in our opinion a stronger negation (one confirmed, too, by xperience) lies in the facts, that an animal not in perfect health suffering, for example, from diarrhœa through change of diet) will ot take vaccinia, and that there is no proof that a bovine or any ther animal disease (except vaccinia and hydrophobia) can be nduced in the human subject by *inoculation*. As regards, next, the bjection that animal virus "does not take easily" in the human ubject, and that it "does not keep well," our author shows that the former is due to bovine albumen being less readily soluble than that from the human subject, and that it can be remedied by bestowing more care in rendering animal vaccine soluble before applying it to an infant. He states that "direct animal virus on ivory or bone points or quill slips keeps as well as any other, and so does this virus in the form of the dried vesicle or scab;" whereas, he considers 30 per cent. of tubes of this virus (fluid) to be not trustworthy in twenty-four hours after their removal.

Two further objections are discussed—and with regret here we notice an unwarrantable amount of blame laid on Dr Seaton by our author. It is urged by some that the vaccination of a heifer with even "living" warm fluid lymph is an uncertain process. From considerable practice in this procedure, I gladly confirm Dr Martin's remark—"properly done, vaccination of animals with bovine virus may be said to be invariably successful, so very rare are the exceptions," the necessary requisites for success being a very decided degree of technical skill, patience, and experience. The last objection examined—and it is one which has hitherto been the principal obstacle to the introduction of animal vaccination into Great Britain—is, "that animal virus is expensive and difficult to obtain." If this be urged in comparison with the Jennerian method (arm-to-arm vaccination), no one can gainsay its validity. But if we receive as true and weighty the advantages accompanying animal vaccination as urged by Dr Martin, and which we feel by experience to be real, if we consider it to be of the highest importance that vaccination of the whole community should be done in *the best way*, and that it is a duty devolving on the government of every country to see this carried out, we cannot help regretting that in Britain, the birthplace of the discovery of vaccination, there is still wanting the means of providing this prophylactic agent in its purity. Each wave of smallpox as it breaks over our country discloses the imperfect protection afforded by long-humanized vaccine even in the case of children under twelve years of age (although I have hitherto in vain endeavo to obtain from the authorities of workhouse and other schools t statistics necessary to corroborate this). Each epidemic, if at a severe, is accompanied by a *vaccine famine*, notwithstandi the much-praised resources of the National Vaccine Institution England; and in the wake of such epidemics we have numberles letters and dissertations published both by the lay and medica press drawing attention to the defects in our national vaccinati arrangements. The recent debate in our House of Commons Mr Pease's Bill afforded an excellent opportunity for advocati the establishment and support by our Government of institution for the propagation and supply of animal vaccine. Four su services or stations, placed say in London, Liverpool, Edinburgh, and Dublin, would meet the want felt. Universal experienc sanctioned by Dr Seaton and other authorities, proves that by the arm-to-arm method vaccine loses its power of inoculability an becomes otherwise altered. Hence the advice given to public vaccinators to change their source of lymph (the vaccinifer) when this is observed; but under such circumstances a supply of animal vaccine would be most acceptable and, we believe, most advantageous. Those medical men and those of the public who desire vaccination from the heifer would thus have the opportunity. I trust, therefore, that Dr Martin's able advocacy of animal vaccination will be followed by the introduction of this method *under Government support* both in this country and in America.

As regards the recent debate before the Metropolitan Counties Branch of the British Medical Association,[1] we have Dr Greene of Birmingham, from personal experience, advocating animal vaccination because of the "advantages this method presents of an overflowing fountain of lymph of a relatively high standard of activity for the renewal of stocks at any time, when opinion or accident makes it requisite." He confirms for the most part the assertions I have made above regarding the various excellent qualities of animal vaccine, and he considers the uncertainty of animal lymph would "be of no consequence with a good stock, with skill and judgment in cultivation, and with the limitations of the method" he specifies.

There is not the slightest doubt that the public vaccination arrangements which were legalized in England in 1867, and have been assiduously carried out there since that date, have improved *immensely* the vaccination and consequent protection of the population. Dr Seaton, too, as the principal initiator and propagator of this reform, may indeed congratulate himself on the happy results; but that thus "we are in possession of the means, if we rightly use them," wherewith "severely fatal epidemics should by-and-by be made to cease from amongst us," is an admission which few will concede who have practically weighed e subject. As a public vaccinator under the Act of 1867, and th the experience of nearly ten years, during which this town has ice suffered from epidemic smallpox, I do not think existing rangements, much less so the vaccine generally employed, are fficient for the efficient protection of the population against allpox. It is very gratifying to learn from Dr Seaton that 95 r cent. of the whole population of England are accounted for as accinated, or dead or unsuitable for vaccination; but inasmuch as ly two-thirds of these have been vaccinated at the public stations here specially qualified persons, duly inspected results, and oroughly active lymph (obtained by arm-to-arm vaccination) are be found, there is still too large an amount of soil open for the ropagation of smallpox. "It is certain," says Dr Seaton (*British edical Journal*, 22d June 1878, p. 888), "that our defences against mallpox, as dependent on the quality of vaccination, are much in dvance of what they were, and as time goes on, the proportion of he population not merely vaccinated, but thoroughly vaccinated, ust be a constantly increasing proportion. . . . . So far as oncerns personal carefulness and a knowledge up to the science of he day, we have no right to suppose that the vaccination of private ractitioners would, as a rule, be found behind the public work; but in regard to the arrangements most conducive to the success of vaccination, private practitioners must necessarily stand at a disadvantage." While these public vaccinators have the advantage of a sufficiency of subjects wherewith to carry on arm-to-arm vaccination, they have the disadvantage that they know nothing of the parentage of the majority of the vaccinifers, and can judge of their suitableness merely from the looks of the mothers and the appearance of the children and of the vesicles. It is just the reverse with private practitioners. Dr Seaton, then, is carried away with the single idea, arm-to-arm vaccination carefully conducted is perfect, and is the only perfect form of vaccination. He nevertheless, like other instructors in the subject, gives certain directions for the renewal of the vaccine if it shows certain improper qualities. The seed is to be always the same, but the soil is to be changed. Vaccine removed from the cow more than eighty years ago by Jenner has been transmitted continuously from that time through human beings, sometimes through children of decidedly unhealthy parentage, sometimes through those in imperfect health, sometimes after purulent transformation has affected the lymph; and yet this fluid is to be considered purified, "due and effectively" protective, by being now transmitted with care through properly-selected healthy children.

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[1] *British Medical Journal*, 22d June 1878.

If vaccine lymph, a most delicate organic fluid, has once been allowed to undergo pathological changes in the vesicles, has been permitted, for example, to remain in the vesicle till the ninth day, or even later, after vaccination, when suppuration has commenced to alter its composition, can it be supposed that it has undergone

ICLE VII—

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normal quantity of fat in a healthy woman's milk is about 17 per cent. This standard is reached about the 36th day; the proport in excess of this, which existed during the previous six weeks I am supposing to be derived chiefly from the old uterus. Thus t old nest passes away, and, in the midst of its decaying fibres, the elements of a new womb are deposited, which gradually assume a form identical with the old non-pregnant one, and when completely reconstructed will remain so until another impregnation takes place, when the same physiological series will be repeated. During this post-parturient period, the internal surface of the uterus exhibits certain features deserving of your notice. The extent of the cavity will be in proportion to the remaining vital activity of the uterus. The firmer the walls contract, the less internal surface will there be. Sometimes you will find the womb firmly drawn together, at other times you will have it partially elastic, and you will meet with cases where, in defiance of all your exertions, the uterus will remain soft and flabby. Immediately after parturition the internal surface feels softer than usual, and is covered with a greenish red fluid. The place which was occupied by the placenta is softer and more pulpy than the rest. In this placental surface several small openings are usually observed. Within the cavity you might find small clots of blood, and little pieces of placenta and decidua. Around the os uteri there is often an orange colour observed, and the os may have a ragged appearance. When the internal surface of the womb is examined under water, and the loose fluid contents removed, its appearance is described as not unlike the raw surface of a stump, and in our obstetric text-books you will frequently find it compared to one. The discharge from the uterine surface serves a double purpose. It provides a drain whereby the material no longer required by the organ is discharged, and it is a means by which the opposite walls are prevented from adhering—a condition which might arise during the granulating process necessary to complete the epithelial layer already partly formed.

The normal duration of the lochial discharge is not constant. It may flow for only a few days, or it may continue for weeks, and yet be perfectly natural. Its early cessation is not of itself an evidence of disease; but, when associated with other symptoms, this condition furnishes important indications for treatment. The discharge is usually prolonged when ulceration at the cervix takes place, or when a similar condition exists either in the cavity of the womb or in the vagina. It has been prolonged by the patient getting up too soon—by the patient not suckling her child, and in some of these cases it has been even prolonged until the usual monthly discharge occurred. Its duration has been lessened where the fœtus was still-born, and had been dead for some days before delivery. This probably was owing to the internal surface of the womb having time for certain changes to be completed towards the reconstructing of its surface, and to the diminished arterial excitement in the organ. The flow is frequently diminished and irregular, sometimes even suppressed, when the mammary glands begin to secrete the milk. Constipation affects the discharge, so also will the mental state influence it. Certain inflammatory diseases also control the quantity discharged. Even with healthy patients, it is very difficult to fix on a given quantity as the standard estimate of the normal flow. The Germans have estimated that within the first eight days 1·485 kilog. pass out. The quantity usually exceeds this when the woman does not suckle her child; I suppose because, in this way, nature provides an equivalent. More oozes out from the internal surface of the uterus owing to none of the uterine debris passing out by its proper channel, hence the milk really finds an exit by the lochia. Where the patient has had many after-pains she will as a rule have less discharge.

For some time observations have been made upon the lochia by myself, materially aided by some of the house-surgeons of this Hospital, with a view to determine more clearly the nature of the discharge, and its significance as a factor in diseased conditions occurring after childbirth. Let me read to you the following cases from the Journal, as examples of the variation which the lochial discharge undergoes in different conditions of childbirth:—

Reported by Mr Kirkwood, House-Surgeon.

I.—Mary M'D., aged 24 years, second confinement, single, last date of menstruation uncertain. Duration of labour—first stage, four hours; second stage, half an hour; third, two minutes. The fœtal heart was not heard, although the uterine souffle was quite distinctly recognised. Before the membranes ruptured it was known that either a knee or elbow would present. Upon rupturing the membranes a knee came down, and without much aid delivery was effected. The fœtus was putrid, and part of the skin peeled off. Her progress was uninterrupted. She made a good recovery, and the daily observations on the lochia gave, on the

1*st Day.*—When examined by the microscope, very few epithelial cells or decidual debris. The discharge was almost wholly composed of red blood corpuscles. A few white corpuscles were seen, but their quantity was so few compared with the red that the colour of the discharge still remained a bright red. The discharge had no tendency to coagulate. In consistence it was more watery than normal blood.

2*d Day.*—Squamous epithelial cells are observed, and are numerous. From their size and shape they appear to be derived from the vagina. The white corpuscles are increased, forming about one-third of the discharge. The colour is modified. It has become pale red. Shreds of decidua were noticed in the discharge.

3d Day.—The flow has increased in quantity. The white corpuscles were in excess of the red ones. The colour is a dirty white. The other constituents of the discharge noticed were epithelial cells and shreds of decidua.

4th Day.—The red corpuscles were very few. The white corpuscles were abundant and had a granular appearance. Epithelial cells abundant; also some shreds of decidua.

5th Day.—Patient allowed to-day to sit up two hours; discharge more abundant The red corpuscles are more numerous than the white ones. Colour of discharge ruddy.

6th Day.—Patient has sat up the greater part of to day. The discharge is still abundant, and appears more sanious; the increase consists chiefly of red corpuscles.

7th Day.—Patient up during whole day. Discharge not so abundant. The red corpuscles have almost disappeared, and the flow now appears to consist of serum, white corpuscles, and decidua.

On *8th day* she left the Hospital feeling quite recovered.

II.—Mrs B. C., aged 20 years, married, was delivered of a female child on 25th August 1877. Second confinement. Duration of labour—first stage, five hours; second stage, half an hour; third stage, five minutes. With reference to the lochia, on examination within a few hours of childbirth, we found the solid part of the discharge to be composed almost exclusively of red corpuscles.

2d Day.—The discharge appears to be made up of white corpuscles, epithelial scales, and red corpuscles.

3d Day.—The red corpuscles have almost disappeared. The discharge now consists of white corpuscles, decidual shreds, and vaginal epithelium.

4th Day.—No red corpuscles observed. The discharge has diminished in quantity

5th Day.—Patient up for a few hours. The discharge has much increased, and the red colour has returned to it. No clots observed to the eye, but under the microscope these were observed ranging from $\frac{1}{30}$th to $\frac{1}{80}$th of an inch. They are of a brilliant red colour, and stand out from the rest of the discharge.

6th Day.—No clots. A few red corpuscles still present. Discharge much less in quantity.

7th Day.—Red corpuscles wholly disappeared. The discharge has a greenish white colour, and it continued so until the 10th day, when the patient was dismissed.

I shall only trouble you with a few details of another case:—

M. H. W., aged 22 years, single, primipara. Duration of labour—first stage, forty-six hours; second stage, one hour; third stage, five minutes. Although tedious, the labour was natural and the perineum was not torn. Patient had arranged not to nurse her

ild. The lochia was normal until the evening of the 2d day, en it increased in quantity.

3d *Day.*—Pain complained of in the region of the uterus, which s relieved upon the application of turpentine stupes, and the scharge returned in greater quantity. The mammary secretion ing abundant, a liniment of belladonna and camphor was plied.

4*th to* 9*th Day.*—The discharge is scanty and consists of red rpuscles, numerous granular cells and epithelial cells, with reds of decidual debris. On the 5*th day* bacteria were observed the discharge, and the smell was stronger, so that we had to peat the injection of permanganate of potass at shorter intervals. n the 9*th day* she complained of pain in the outer aspect of left g ; but there was no œdema or swelling detected until next day, hen a circumscribed swelling was observed, and which ultimately rmed into an abscess. On the 11*th day*, at the request of her elatives, she was removed home. (The house-surgeon was nable to make stated observations on this case, owing to the requent application of the injections.)

These examples are extracted from the Clinical Journal of last ugust. I might easily multiply them, but I think we will be etter employed in following the usual method of examining this ischarge, and for that purpose we will study the constituents of he lochia as they may be observed during the three usual varieties f colour the lochia passes through before it quite dries up.

FIRST PERIOD.—DISCHARGE ALMOST PURE BLOOD.

This discharge is dark red in appearance. It is derived chiefly from the placental surface, and the quantity is regulated by the completeness of the uterine contraction. The flow is more subject to modifications shortly after childbirth than afterwards. It may remain fluid, or may coagulate and pass out as clots. It may be retained within the uterus for a longer or shorter time, or may discharge when formed. Any of these conditions may exist, and are likely to arise during the time, say, from the first hour after the expulsion of the after-birth, up till about the third or fourth day. Judging from the average of the cases which we have examined, the first alteration begins about twelve hours after the placenta is delivered, when the white corpuscles are found beginning to increase in number; these rapidly increase, accompanied with a serous fluid of alkaline reaction. By the microscope we observed during this period the discharge to contain blood corpuscles, flat epithelium, mucous corpuscles, granular masses, and occasionally also fragments of the decidua and placenta. The flow varied in quantity; as a rule, the slower the uterus contracted, the more fluid passed out. It was modified by the placenta being adherent or diseased, by lacerations, and by the quantity of the normal menstrual flow. We found the discharge less when a flooding had occurred.

SECOND PERIOD.—DISCHARGE OF SEROUS BLOOD.

This non-coagulable flow sets in about the third or fourth day, and continues until about the end of the seventh day. It is characterized by the abundance of the epithelial scales, mucous corpuscles, and a reddish slime. By the microscope you would observe pus which now appears and gradually increases in quantity. You would also notice fewer blood corpuscles, the rest of the discharge consisting chiefly of granular cells and fat globules. During this period the flow is thicker from the presence of molecular granules, it gradually becomes whiter—"milky"—and its quantity daily diminishes.

THIRD PERIOD.—DISCHARGE OF YELLOWISH-WHITE LIQUID.

This is usually a thick, oily-looking discharge, varying somewhat in colour, and having a neutral reaction, which, towards the end of the eighth day, becomes faintly acid. The quantity varies. It is more abundant when the patient does not suckle her child. In normal cases it lessens from day to day. That you may form some estimate of the decrease, I may mention that a patient usually requires about a dozen napkins daily to receive her discharge for the first day or two after childbirth; now, one or two daily may suffice. The discharge, as revealed by the microscope, is found to consist of pus, few epithelial cells, numerous spindle-shaped tailed corpuscles of young connective tissue, and fat globules and granules. During our inquiry we discovered no material but what had already been observed by Wertheimer and others.

From the observations of others, and from our own investigations, some inferences may be adduced, such as, that, while the blood passing out in the lochia is irregular in quantity, it usually diminishes from childbirth onwards. In all the patients under our observation who made a normal recovery we found this to be the case. The red corpuscles diminished or increased without affecting the patient or the character of her recovery. The white blood corpuscles increased in quantity until the third day, when the maximum number seemed to be attained. The flat epithelium only increased in acute disease. The ciliated epithelium were found both in healthy and diseased lochia. They have also been found in the discharge of non-pregnant women, and so may be considered as not a constant constituent peculiar to the discharge. Neither do they seem to affect the health of the patient, or to be an exciting cause of disease. The other important ingredients of the lochia were the granules and the bacteria, and, as the latter appear to have an important relation to diseased conditions originating during the post-parturient state, we will consider these bacteria more fully.

A woman, in childbed, recovering from a natural labour, has en compared to a wounded person, and the microscopic amination of the discharge teaches us that the uterus then rresponds, in some respects at least, to an ordinary wound. hen sores become unhealthy, the putridity is supposed to be e to the presence of the bacterium in the discharge. These me bacteria have been found in the lochia during certain febrile nditions of the patient, and notably, when septicæmia was esent. They appear as short, cylindrical, colourless bodies, mposed of protoplasma, which we are told is nitrogenous. hey are usually seen when recently removed in rapid motion, ut when united in amorphous slime colonies, they may be seen a state of rest. These belong to the vegetable kingdom, and re supposed to be the cause of putrefaction. It appears there re various kinds of lowly vegetations besides the bacterium ermo, and not unlike it, which exist in discharges from animal issues. It seems we have not got quite into their world. With he microscope we get the general outline, but we are unable to istinguish the particular organism which accompanies, if it does ot give rise to, septicæmia, from those innocent forms which so losely resemble it. The life history of these interesting vegetations as not yet been worked out. M. Pasteur has found that bacteria ay present themselves in two forms, one kind being destroyed at a emperature of 212°, while the other kind can resist a temperature f 248°, and that some require about two hours' boiling before being effectually destroyed. It has been ascertained that bacteria will grow readier in an alkaline than in a slightly acid solution. May this be the reason for the popular belief, that from a certain day after confinement the patient is safe? At first the lochia is alkaline, then after a few days it becomes neutral, and by the eighth day it is slightly acid. I have not observed septic disease originate after the lochia became acid. Should the bacteria be simply developed in the lochia the effect may be local. When, however, a wound exists capable of absorbing, the poisonous organism will pass into the body, and produce the constitutional mischief. I have thus seen a clot within the uterus, by acting through a slight laceration at the cervix, produce febrile symptoms and lead to mammary congestions. We frequently forget that uterine irritation may be the exciting cause of the mischief to the breast, and direct our treatment solely to the local condition without benefit, then afterwards find the simple removal of the irritating intra-uterine clot has led to marked benefit, and proved the only effectual means of allaying the mammary irritation.

The *odour* of the lochia is usually very slight, but sometimes, even in health, it is so strong as to produce a curious, sickening, disagreeable smell. It is most marked in fair women. It depends also upon other causes than the mere temperament of the patient. The want of cleanliness very soon intensifies the smell, as do also coagula retained within the uterus. A prolonged labour, causing injury to maternal parts by bruising, has given rise to a fœtid discharge. Cancer of the neck of the womb, when complicating the labour, gives its characteristic smell to the flow. Any lesion in uterus or vagina may prove the source of altered smell, and give varying degrees of offensiveness to the discharge. When this is not very putrid it may indicate simply decompositions of the coagula, parts of the membranes left, or a slight injury. When, however, the odour is decidedly fœtid, and the discharge of a coffee-ground colour, you may infer that gangrenous inflammation has taken place. When the discharge is fœtid, purulent, and excessive, and the temperature increased to, or above, 102° F., I have usually found these symptoms point to the existence of a uterine lesion with septic absorption. In phlebitis, on the other hand, the lochia is also very fœtid, and in excess, but the discharge is almost hæmorrhagic; while in metritis, if acute, the discharge is fœtid, diminished, and when not arrested, bloody and purulent. In several cases of forceps delivery, or when a prolonged second stage had occurred, I have observed a fœtid discharge afterwards setting in, which was due to injuries either of the vagina or the perineum but this alteration rarely produced a constitutional disturbance.

Having to watch over a discharge in every respect as important to the accoucheur as the fluid formed by suppuration is to the surgeon, it is not unnatural that we should take advantage of any improved methods of treatment, and attempt to adapt these to the management of the lochial flow. Already, from Paris and Berlin, reports have come describing methods of treatment by antiseptics, but it is too soon yet to draw a comparison from their results. Besides, I would rather have you at present consider how far the means naturally provided may be relied upon, in all ordinary cases, to give sufficient protection. With the surgeon a drainage-tube is necessary to allow of a sufficient discharge; with our patients, the cavity is so constructed as to obviate any necessity for this. The nursing of an infant, requiring the mother to move from side to side, aids the flow; and when a too rigid adherence is not demanded to the recumbent position after the first forty-eight hours, but the patient is permitted to have her food sitting up, and to perform other necessary duties in the usual manner, then she further aids the natural process of emptying the cavity of its contents. I think it a pernicious practice to keep a puerperal patient lying on her back for days. It is at the lowest part of the cavity—at the os uteri—where fissures, when made, are most likely to take on morbid action. While lying on her back the patient keeps the fluid there, and should either the diathesis be depraved, or the discharge be infective, we keep the patient in the best possible position for acquiring disease. In allowing of free movements in bed we provide very efficient prophylactic treatment, and in a normal labour you are not expected to opt other and more stringent measures. Where, however, there s been an offensive smell from the amniotic fluid as it escaped; hen a putrid fœtus was given birth to; where you suspected cerations to have taken place either in the cavity or at the erineum; where you had to do with a narrow pelvis, with the ead arrested at the superior strait or at the outlet: in any cases ch as these, requiring operative measures or delay in delivery, would advise you to adopt precautions—precautions pointing to e maintenance of a healthy discharge, and towards securing ntiseptic protection. I believe for all vaginal examinations, and specially in those required for ascertaining the state of the labour, nd for watching its progress, that vaseline is the best agent to mear over the fingers. It is a pure emollient, with slight ntiseptic properties, and it is cleanlier than lard or oil. On he completion of the labour the patient should have all the disharges carefully wiped away. This should be specially attended o at the vulva, as clots are apt to form at the pubes, and heir remaining there may prove mischievous. Afterwards the external parts should be sponged several times a day, as well as fter micturition. The napkins should be frequently removed; the clothing around the patient should be dry, clean, and comfortable; and all this ought to be managed without any exposure of the parts. The soiled clothes should be removed from the bedroom as soon as they are taken from the patient. We are working with a delicate organism, and although labour be a healthy process, the very delicacy of the structure makes a trifle, when in error, produce formidable results. The remembrance of this will lead you never to consider a detail too trifling for your notice. In special cases, where I have deemed an antiseptic plan of treatment necessary, I have tried the carbolized gauze. I put two or three layers of it, extending from the navel down nearly to the knees, to act as an apron, and over it I applied the binder in the usual way; otherwise the treatment consisted in the use of the gauze instead of napkins to receive the discharge. I have discontinued this plan, because the ladies objected to the strong carbolic odour given off. I found, also, when sickness overtook mother or child the gauze was blamed for it. They also found fault with the gauze for chafing the parts; and these seeming reasonable objections, I have not persevered with its use. I have employed also Westmacott's medicated tow, but I found the same objections offered to its use. At present I am employing thymol. You may dissolve it with the aid of spirit, so as to make a solution of 1 part thymol to 500 parts water; and in this form you will employ it for sponging with. I prefer to use this preparation, made by adding three grains of thymol to an ounce of Eau de Cologne, and to simply sprinkle it over the napkins before they are used. You will observe the odour is pleasant and rather refreshing; and in the few cases in which I have employed it no objections were offered to its use. In some cases I employed the disinfecta proposed by Dr Day of Geelong. It is a mixture of turpenti rectified benzine, and oil of citronella. You may sprinkle t liquid over the ordinary napkins in use and hang them up to d Afterwards, as these are soiled by the discharges, the disinfecta becomes revivified, and a disagreeable odour is prevented.

Besides these means, in suspected cases I use the intern injection of various remedies. In ordinary cases, where no spec indications would lead you to employ a peculiar drug, you hav choice of the permanganate of potash, a solution of carbolic ac 1 to 40, or of a solution of thymol, 1 to 1000. In severe cas with a putrid odour, I use a solution of the permanganate potash, injecting it with a Higginson's syringe having a vagin portion attached, and continue injecting it until the fluid retur unaltered in colour. In all cases where the discharge is excessiv I use the tincture of arnica. It may be used in the proportion one teaspoonful to a cupful of water, and you will find it act we as a mild astringent and disinfectant.

Whenever you discover you have to deal with a septic complication, I would advise you to employ the sulpho-carbolate of potash, giving it in the form of powders in doses from 10 to 15 grains internally, three times a day. In an epidemic of septicæmia which we had in this hospital, this treatment, aided by the injections, proved beneficial. When the discharge is suspended, find out if possible the exciting cause, and remove it. The treatment to restore the flow consists of turpentine stupes applied over the lower part of the abdomen, with the addition of warm moist cloths, or of sponges pressed out of hot water, and applied to the vulva. In nearly every case I examine the supra-pubic region on the second day, and when I do not find the uterus smaller than it was at delivery, especially should tenderness be felt there without increased temperature of skin, I apply friction over the womb to reduce it, and failing in this, I order stimulating applications, such as a turpentine stupe, to be applied, and when this does not relieve the enlargement, I have derived advantage from conjoining a half-grain morphia suppository with it, night and morning. In like cases, but accompanied with a relaxed condition of the organ and an excessive discharge, ʒj. doses of liquid extract of ergot, repeated every three or four hours, and

℞ Quinin. sulph., ʒss.
Acidi hydrobromici, ʒvj.
Aqua, add ℥ij.
Dose.—ʒi. in aq. ter in die.

(which enables you to give large doses of quinine without causing a headache) will generally give relief.

To multiply further the indications for treatment of disorders of the lochia would lead me to speak of the most frequent of the post-parturient diseases. These will be considered later on, and en speaking to you about them, opportunities will be afforded for considering the local, along with the constitutional, treatment culiar to the condition present. It only remains for me to urge u ever to bear in mind, that the treatment which is most satisctory, and which shows our calling as obstetricians to most vantage, is that which is *preventive* rather than that which is *rative.*

RTICLE III.—*Chronic Cervical Metritis Treated by Interstitial Injection, coupled with Dilatation.* By JAMES M. BENNETT, M.D., Surgeon to the Liverpool Surgical Home, and Consulting Surgeon to the Liverpool Dispensaries.

The substance of a paper read before the Lancashire and Cheshire Branch of the British Medical Association, 1878.)

MONGST the number of diseases which come under the care of the ynecologist, there is not one, apparently, so slight and yet so diffiult to restore to its pristine condition as the chronically enlarged s uteri. Whether we accept the old pathology, and regard the irst stage as simple engorgement of the parenchyma (congestion), nd the second consisting of lymph effusion, the morbid action in vhich, unlike that in other parts, ceasing to approach suppuration, ut remaining either stationary in size or diminished with increased nduration; or, on the other hand, that we receive the opinions of Scanzoni, Klob, and others, who believe that no inflammatory action is necessary, but simply congestion and a proliferation of the connective tissue of the part as the correct definition,—the facts yet remain that engorgement, sensitiveness, increase of weight, and induration, as the result of abnormal action, present themselves as a disease so frequently as to cause authorities like Sir J. Y. Simpson, Marion Sims, Henry Bennett, Athill, Aran, Churchill, West, Scanzoni, Graily Hewitt, Barnes, and many others, to lay particular stress upon its diagnosis and treatment. From the number I shall just give the special remarks of a few. Simpson says that inflammatory enlargement and induration of the tissues of the os and cervix were very frequent in practice, and existed in most cases of very chronic leucorrhœa. Marion Sims found it the most frequent of diseased states, and considered that it always existed in conjunction with artificial occlusion of the os. T. Gaillard Thomas "considers it the most important subject in his work;" and Dr Athill says, "These cases have long been the opprobrium of the obstetric physician, whilst their extreme frequency gives to them an importance which the direct effects they exercise on the duration of life does not warrant." I think I need hardly quote further authority to point out their importance, and can recommend none who so well distinguish the main features by which the benign and malignant varieties are to be recognised than Drs H. Bennett and

Graily Hewitt. As to the causes of this diseased state, the leng of time allowed by your rules would not permit me to exami further than to state that parturition, injuries, excessive sexu indulgence, pessaries, displacements, cervical endometritis, a long-standing dysmenorrhœa, which, according to Scanzoni, rare fails to induce some change of tissue in the uterus, the most common being hyperplastic enlargement. Dr Rigby did not seem s far astray when he said, that the uterus being placed at the lowe part of the trunk had to support the chief weight and pressure o the intestines, and being subject to such great periodic change o vascularity, not to mention the wonderful changes undergone durin pregnancy and parturition, were particularly liable to be the se of congestion.

Of its complications I shall merely mention displacements, cystitis, cellulitis, and by interfering with the functions of the uterus, we have menorrhagia, dysmenorrhœa, and sterility as its frequent accompaniments.

Of its treatment from Dr Rigby, who mainly depended upon general, to our latest authorities, many and varied have been th means adopted for its cure. Simpson, after describing the use of Vienna paste, nitric acid, etc., etc., concludes with the recommendation of the abandonment of all in favour, perhaps, of the most destructive, potassa fusa, which he directs to be applied in the form of a stick, and well rubbed in, until a piece three-quarters of an inch, or even an inch, was melted down. Well might he say the decomposition produced a hissing sound. The editor of Dr Simpson's work upon *Diseases of Women* says "that the caustic was used far less frequently than might be inferred." Gendrin depended upon Vienna paste, whilst Jobert used the actual cautery until, he says, "it melted away." Many of their followers adopted the same line of practice, but in a more moderate form. Marion Sims treats by dilatation, and thinks highly of the power of the sponge-tent to modify the uterine surfaces with which it comes in contact. He says, "it dilates the neck of the womb, it softens it by pressure, and by a sort of serous depletion reduces the size not only of the neck, but of the body of a moderately-hypertrophied uterus, whilst the addition of glycerine sets up a sort of capillary osmosis." The same authority, speaking of the abuse of potassa fusa, potass c. calc., and even nit. argent., says sometimes the os uteri becomes wholly occluded by the prolonged use of these agents; more frequently it is partially closed, and the cervix always contracted.

Dr Greenhalgh treats with iodized cotton and glycerine.

That some other mode of treatment than the tissue-destroying processes which have so aften come into fashion, and which, after receiving the highest of eulogies, have ultimately disappeared in favour of some new agent, which in time was bound to suffer the same fate as its predecessors, and, it is to be hoped, has like them rmanently joined the host of torture agents, such as moxas, tons, issues, etc., etc., which were long such prominent parts of rgical armorium. Having tried most of the constitutional and cal formularies recommended by our most celebrated authorities, I as induced to try the interstitial injection of iodine, from the fact at I had, in the first place, obtained more benefit from its local pplication in the form recommended by Dr Greenhalgh than other eatment adopted; and, secondly, from the consideration that, if uch benefit could be gained by its application to the indurated overing of the os uteri, much speedier and more lasting results night be attained by the absorbing agent being brought into direct ontact with the new hypertrophic matter distributed in the midst f the uterine tissue, and where absorption might be favourably ought. Acting upon these bases, I first prepared my patient oth generally and locally. The latter, by relieving any super-ngorgement by local depletion carried out by means of cupping, he frequent use of warm water lavement, and the application of glycerine, so as to induce osmotic action, care being taken to avoid the period of menstrual excitement. I then use this simple modification of the hypodermic syringe, which you may perceive is sufficiently long to be used with Fergusson's speculum; its points are made of 18 carat gold, and the other portion which might come in contact with the iodine, bromine, or other agent inimical to any metal less resistant than gold or platinum, is mercurially gilt. The instrument should be charged with a solution composed of ten grains each of the iodide and bromide of potassium, to which half a drachm of tinct. of iodine and sufficient distilled water should be added to bring it up to two drachms. I then either puncture through the speculum, leaving the uterus free, if the os and cervix be very large and low down, or fix it with Sims's tenaculum, using a duckbill speculum. I generally make from three to five punctures, according to the amount of hyperplastic matter to be absorbed. A cotton pledget well soaked in glycerine is placed against the part, and rest enforced for at least twelve hours. I seldom find that more than three operations are required, and have never found any disturbance of moment set up either generally or locally by its use; but, on the contrary, have had a number of cases turned out successfully where other methods had proved unavailing. I may mention, that I have now a case under observation where a female of 38 years of age, who had been the mother of three children before she was 30, who had suffered from sub-involution, followed by chronic cervical metritis, and remained barren until after December last, when I treated her by the foregoing method. She is now in the fifth month of pregnancy, and enjoying good health. In most cases I conjoin the treatment with dilatation by means of the sponge-tent, which I put in practice after the first effect of the interstitial injection has passed off. By means of these combined methods of procedure my most sanguine expectations have been fulfilled, the hypertrophied os materially lessened and restored to its healthy condition, and that with an absence of those after-consequences such as loss of tissue, painful cicatrix, &c., stricture, which must have presented themselves to the practitioner who has steadily adhered to the mode of treatment by caustics, cauteries, etc., etc. I may add that I have ventured to try this mode of treatment in some cases of chronic sub-involution, with this difference, that I first begin with the interstitial injection of a solution of ergotin, and follow it after an interval with the iodine. My success has been such as to warrant a more prolonged trial. The only drug administered has been the bromide of potassium in large doses, with the double purpose of quieting nervous excitement, and, on the possibility of obtaining some of the benefits described by Professor Binz of Bonn, who speaks of the potash salts as being positively specific in sub-involution; and, mythical as it may appear, I have many times seen advantages derived from a continuous use of this salt quite equal to those described by Dr R. Williams, who attributes such wonderful powers to its action in splenic hypertrophy.

ARTICLE IV.—*The Physics of the Bladder and Ureters.* By ALEXANDER JAMES, M.D.

(*Concluded from page* 300.)

LET us now apply these facts to the physics of the bladder, ureters, etc., and let us take the ureters first.

The ultimate tenacity of the ureters is, as we have seen, about 5 feet hg., and the greatest pressure which can be exercised by the urinary secretion is about 2·4 in. hg. Supposing now that, as regards the proportion between the proof and ultimate tenacity, the ureter resembles the intestine, and allowing for the weakening which would result from distension, let us assume that in four hours 2½ feet hg. would be sufficient to cause rupture. This would, however, be about twelve times greater than the greatest secretion pressure in the ureters; but further, if a ureter be completely obstructed, the amount of urine secreted in four hours would be far more than sufficient to distend the entire urinary tract above the obstructed portion. In this way the secreting process would be arrested, and the secreting tissue would become destroyed. Hence, in cases of complete obstruction of the ureters, long before such a comparatively slight force as that of the renal secretion will have had time to act so as to cause distension or rupture, the kidney structures will have become disorganized and destroyed. It is otherwise, however, when the obstruction is not complete. Here the secreting pressure will probably never be so high as 2·4 in. hg.; but, at the same time, as there will be no arrest of the

retion, it will continue acting, not for hours only, as in complete
struction, but for weeks, months, or years. It will thus cause
tension; and, as we have seen, the more this occurs the less will
the power of resistance to further distending force.

Hence dilatation of the ureters can never occur to any extent as
result of complete obstruction. The time allowed to the dis-
ding force to act is so short, that long before it can have had any
ect in causing distension the secreting tissues will have been
stroyed. On the other hand, we can understand how readily it
ll occur when the obstruction is incomplete, as here the pressure,
ough not so great, acts for a long period of time. We need not
scuss the possibility of rupture of the ureter. Let us now apply
e same two physical considerations to the case of the bladder.
the first place, then, we have our distending force the same as in
e case of the ureter, *i.e.*, not exceeding 2·4 in. hg.; but, in the second
ace, inasmuch as the size of the bladder is very much greater than
at of the ureter, the effects of this pressure will be correspondingly
creased. For instance, in a case of completely obstructed ureter,
e may, I think, safely say that the resulting distension will not
xceed ½ in. in diameter, whilst, as we have seen, bladders contain-
g 20, 40, or 60 oz. urine will probably have diameters of about 4,
, and 6 in. respectively. Thus they will have 4, 5, or 6 times less
ower to resist the distending force. Further, the quantity of
rine secreted in a given time is so great as to preclude the idea
hat a corresponding increase of the substance of the bladder walls—
s occurs, for example, in the uterus, *pari passu*, with its dilatation,
uring pregnancy—could occur.

Thus, then, we may with reason suppose that a bladder, if the
xit of urine be completely prevented, is very likely to burst, and
hat, too, in a comparatively short period of time.

To obtain some more precise information on this point, I have, during the past few months, performed experiments on many bladders, both human and animal. My results, probably owing to the fact that there are great variations in the size and strength of this organ in different, otherwise similarly, constituted individuals, both human and animal, are somewhat indefinite. Such as they are, however, they entirely corroborate the above conclusion.

The points which I have endeavoured to determine are—first, Can a pressure not exceeding that of 2·4 in. hg. burst a bladder, the exit of water per urethram being prevented? and, secondly, What is the proportion between the amount of pressure, on the one hand, and the time occupied in bursting, along with the amount of distension, on the other?

The method employed was to distend the bladder with water, raising or lowering the head of water according to the pressure required. As, however, I found that in this way there was a certain amount of oozing through the walls, and as, when the head of water was small, this took place to such an extent as to effect prevent the bladders becoming further distended, I, after se trials and failures, fell upon a plan which, though it has one g disadvantage, yet gives fairly trustworthy results. This wa distend the bladders indirectly by means of a large-sized in rubber balloon. Such a balloon when collapsed can be eas introduced into the bladders of sheep after they have been fir slightly distended with a few ounces of water. This previous d tension I found to be absolutely necessary, as the bladders w all tested within a short time after death, and were, when obtained them, so firmly and completely contracted as to rend introduction of the balloon impossible.

The great disadvantage of the balloon is, of course, that it do not give us the exact amount of pressure which the bladder has t bear, as a certain amount of pressure is taken up in distending it own width. Hence the results must not be taken as absolute correct, although comparatively they may be regarded as being s

I have selected the following sixteen cases as being the most trustworthy and characteristic. The first eight were taken from one lot of sheep, and the second eight from another, the former being of rather larger size. In all cases the experiments wer made within a few hours after death.

TABLE II.—Bladders of Sheep.

No.	Head of Water in Feet.	Time.	Amount of Water at Bursting.		No.	Head of Water in Feet.	Time.	Amount of Water at Bursting.	
		Minutes.	Ounces.				Minutes.	Ounces.	
1	9	2¼	31	First Set.	9	5	4	38	Second Set.
2	9	1 m. 55 s.	34		10	5	5	40	
3	8	4	33		11	4½	5	50	
4	8	2	36		12	4½	4½	60	
5	7	4	48		13	4	18	48	
6	7	2½	45		14	4	20	65	
7	6	5	65		15	3½	75	70	
8	6	5	50		16	3½	80	50	

The results show that the greater the pressure the more rapidly will the bladder burst, and the smaller will be the amount of water required; while the less the pressure the longer is the time before rupture, and the greater the amount of water held. The lowest amount of pressure is represented by a head of water of 3½ ft. This is about 1½ ft. higher than the urinary secretion, and would seem to give us no grounds for the belief that such a pressure could cause rupture; but, on the other hand, we must remember that the balloon itself will take up some of the pressure, and that the time was not very great. Further, I have frequently succeeded in bursting bladders, both of the sheep and pig, with the balloon and only 3 ft. head of water in periods varying from 4 to 40 hours.

Of human bladders I have tested twenty, but as the individuals m whom they were derived differed from one another in age, sex, d pathologically, the results obtained are very discordant. The ongest was probably that of a boy aged 13 years. With a head water of 6 feet it held for 72 hours, when the experiment was opped, and it was then found to contain 16 oz. water. This adder was afterwards caused to burst almost at once by a head of ater of 10 feet, the amount of water being a little over 16 ounces. everal of them I succeeded in bursting with a pressure of 4½ feet d 5 feet water (balloon included) in periods varying from 20 inutes to 48 hours.

The last one I treated was specially interesting. It was that of particularly well developed and muscular man aged 34 years, who ad been killed by a gunpowder explosion. The bladder was very apacious, being distended when obtained, and with the balloon and ½ feet head of water, it took in 50 ounces very rapidly. It was hen left in a vessel of water (so as to prevent drying), and allowed o distend. It took in water rapidly at first, and afterwards more lowly, and burst in 60 hours, having taken in 18 ounces more water—in all, 68 ounces. I then, by means of a mercurial manometer, made an estimate of the amount of pressure taken up by the ndiarubber balloon, and calculated that in this experiment it must have amounted to 2½ in. hg. As the total head was 4½ feet water, we may conclude that this bladder burst in 60 hours with a pressure of about 1 foot 9 inches water, *i.e.*, about 12 inches below that of the urinary secretion. We need not here discuss whether the bladder tissue is weaker during life than after death; probably it is so. It is necessary, however, to remark that, as regards the manner of bursting, the human bladders differ from those of the sheep. In the former the rupture occurs usually near the neck, and always at a part uncovered by peritoneum; in the latter it takes place near the fundus, and through the peritoneum. In the human subject the peritoneum is proportionately much stronger.

These considerations will, I think, enable us to understand how readily a bladder may rupture if the exit of urine be completely prevented, and further, how the maintenance of a high specific gravity of the retained urine may be explained. But we must always bear in mind that we can never in experiment fulfil all the conditions existing in the living body. The circumstances are very different, but I feel convinced that, as far as the subject of this paper is concerned, the difference is one which will cut both ways. On the one hand, in the human body the bladder is to some extent bound down by the tough peritoneum, and when full further distension is prevented below by the bony pelvis, and impeded above by the muscular abdominal walls. Hence any of the numerous conditions which increase the abdominal pressure will have the effect of checking distension, and, while tending to prevent rupture of the bladder, will correspondingly aid the occurrence of suppression of urine.

On the other hand, as the experiments of Wertheim, Ca and others show, we must remember that the direct cohesion the fibrous tissues is greater after death than during life; a from my own observations, I feel sure that at the same time th proof tenacity is higher and extensibility less.

Clinically, some cases of retention have been reported as end by rupture of the bladder, and others by suppression of urine, b I have not been able to obtain particulars sufficient to enable m to form an opinion as to the cause of these different methods o termination.

Further, the consideration of these two physical points—the pr tenacity, and the weakening which results from increased capacity—enables us also to understand many other processes which occur i the body,—how, for example, in the circulatory system a slig increase of the blood-pressure, or a slight weakening of the card or vascular walls, may cause gradually-increasing dilatation of th heart or vessels, or aneurisms, which enlarge and burst. The secon point further shows us the value of the clot in the case of the latte

Similarly they explain how readily a very slight pyloric obstruction will cause dilatation of the stomach, how cystic tumours an abscesses distend and burst, how the treatment of continuous extension acts, etc., etc.

Of the dynamics of the ureters I know absolutely nothing, an as regards this in the case of the bladder, I have very little information. Such as it is, however, is rather interesting.

The greatest expulsive power of the bladder, including the abdominal pressure, voluntary and involuntary, I found to be in the case of a healthy adult, aged 26 years, 4 to 4½ in. hg. The position, erect or lying on the side or back, made little or no difference.

In a female, aged 35, affected with diabetes insipidus, it was found to amount to 38 in. water. In three cases of paraplegia which I tested carefully as here, I could eliminate the abdominal pressure, obtaining the expulsive force of the bladder itself. I found it to amount to 20, 24, and 30 in. respectively. In all cases the rise of the columns of hg. or water was the same, whatever the amount of the urine contained, showing that the muscular fibres of the walls of the bladder, like those of other hollow muscular organs, as the uterus, though they lose force in becoming shorter, yet compensate for this by acting on a fluid contained within a sphere of smaller radius. This fact I had many opportunities of observing in the third of the paraplegic cases just mentioned. The bladder was somewhat irritable, and I had to wash it out at intervals. While doing so I frequently found that after expelling its contents it would remain so firmly contracted round the catheter for 30 seconds or longer at a time as not to admit a single drop of water even with a head of 3 feet. This is specially interesting when considered in connexion with the paper on "Hydronephrosis," which I had the honour of reading

ore this Society last session, and in which I endeavoured to show t the increased frequency of micturition which occurs in irritable dders will cause dilatation of the ureters and renal pelvis by mming up the secretion in the ureters.

In this paper, then, I beg to lay before the Society the following nsiderations:—

1. The great importance of the *proof* as distinguished from the *timate* tenacity.

2. That the secretion pressure of the urine (2·4 in. hg.) is not fficient to cause any marked dilatation of the ureter in cases of dden complete obstruction, but is so where the obstruction is rtial or gradual.

3. That the secretion pressure of the urine is sufficient to burst e bladder in cases of sudden complete obstruction.

4. That the contractile force of the bladder is greater than that the secretion pressure of the urine.

In conclusion, I have to express my thanks to Mr Scott Lang r the most valuable assistance I have received from him whilst riting this paper.

RTICLE V.—*On Death from the Insufficient Administration of Chloroform.* By DAVID HART, M.D.

RUGS, like stocks, have their ups and downs. Sometimes a nedicine, which has hitherto led an obscure and humble career, redited only with some doubtful ill-ascertained virtues, if, indeed, with any, rises with a bound in the professional market, and is sserted to be a specific in some disease, as well as one that should have a fair trial in many more. The converse of this is also true; for occasionally some long-tried and apparently well-established therapeutic agent begins to have doubts hinted as to its safety, cases are quoted where it has failed to cure, or succeeded only in killing; and soon the professional hubbub — unfortunately too easily raised—gets up against it, and it may even appear as if it would likely descend from its lofty pinnacle to one of somewhat suspicious value.

Now, in the first case we have imagined, the sudden rise may be due to real virtues; perhaps it is as often brought about, to say the least of it, by some practitioner more anxious to bring notoriety to his own name than healing to his patients. It is also as true that a drug may fall in value deservedly because the virtues claimed for it have only existed in the imagination of its puffer.

But we must also remember that if a drug, really good and efficient in certain instances, be administered in unsuitable cases, if its true physiological action be misunderstood, and if it be administered in the very way and to the very extent it should not, then any fall in its professional value is due not to its own failings, but to those of the medical man who has endeavoure use it while ignorant of how really to do so.

We have made these remarks preparatory to the considera of deaths under chloroform where it is asserted that the chlorofo killed, that every precaution had been taken, and that the bla should be divided between the chloroform and the fatty heart; a just as a minister, in enforcing some practical point, bases h remark on some scriptural phrase or incident, so we intend to u as a peg for our subsequent remarks a carefully-recorded case i the *British Medical* for 25th May 1878. This is as follows :—

DEATH WHILE UNDER THE INFLUENCE OF CHLOROFORM.

Elizabeth P., 34 years of age, was admitted into the Ea Suffolk Hospital, under the care of Mr Brunford Edwards, on the 8th inst. She was suffering from *fistula in ano*, and was stated t have been of very intemperate habits. Two days after admissi she was brought into the theatre for the purpose of having the fistula operated upon. She was very nervous, and greatly dread the operation, which she was strongly advised to undergo without anæsthesia, but this she positively refused to do. Accordingly chloroform was administered in quantities of half a drachm at a time on a few folds of lint. Her pulse was rather feeble and quick, conditions which, in the absence of other symptoms, wer attributed to her fear of the knife. The chloroform was slow in its effect; but beyond considerable struggling and excitement at the end of the first stage, there were no unusual symptoms. As soon as anæsthesia was *barely* produced, not more than three drachms having been inhaled, the administration was discontinued. The character of the pulse had not materially altered, and the breathing, though somewhat rapid, was fair. The patient was now turned on her left side for the convenience of the operator, the fistula was examined, and a director inserted. Just as the division of the fistula was being performed, *about two minutes after the withdrawal of the anæsthetic*, the patient gave a sharp scream, the pupils dilated, urine was passed involuntarily, the face became pale, and, simultaneously, the heart's action and the pulse suddenly ceased, and, after a few moments, the breathing stopped also. Artificial respiration upon Howard's plan was immediately commenced, fresh air in abundance was admitted into the room, interrupted shocks from a coil were applied over the heart, brandy was injected per rectum, and the right medium basilica vein was opened. A few feeble respiratory movements occurred once or twice, but no heart sounds could be detected. After more than an hour had elapsed, the attempt was abandoned as hopeless. At the post-mortem examination, nineteen hours after death, the heart, as seen *in situ*, was firmly collapsed and very pale, and covered with a thick layer of fat. On removal, the organ weighed oz., and its cavities were quite empty. The walls were remark- y thin and very pallid. Microscopical examination revealed ll-marked fatty degeneration of the muscular fibres. There was istinct patch, apparently atheromatous, on the mitral valve, and base and transverse part of the arch of the aorta were athero- tous over a considerable extent. The other organs were very ngested, but otherwise healthy. At the inquest a verdict of eath from the action of chloroform on a diseased heart" was urned.

The facts to be noted in this case are the following:—" 1. næsthesia was barely produced. 2. Not more than 3 drachms ere inhaled. 3. Just as the division of the fistula was being rformed, about two minutes after the withdrawal of the anæs- etic, the patient gave a sharp scream, the pupils dilated, urine as passed involuntarily, the face became pale, and simultaneously e heart's action and the pulse suddenly ceased, and after a few oments the breathing stopped also."

Now, in endeavouring to ascertain why this patient died, we ay proceed to exclude certain causes. The chloroform evidently id not kill her, as only 3 drachms were administered, and this in a ay by which a considerable amount of evaporation is allowed. Nor was the patient allowed to choke, as the breathing was care- ully watched and noted to have been, previous to operation, "fair ut rapid." The real explanation seems to be afforded by the acts that the anæsthesia was insufficiently produced, and that he heart suddenly stopped just as the knife was being used. We might accordingly conclude from a mere inspection of the recorded facts, that the division by the knife killed. How it did so we must now inquire.

Reflex inhibition of the heart in the lower animals by a blow on the intestine, crushing of the foot, etc., are now well-known physiological facts (Goltz). While stimulus of the vagus does not as a rule permanently stop the heart in the lower animals, it may do so (Lauder Brunton, B.M., 4th Dec. 1875), and it is well known that all inhibition of the vagus in man by pressure on the neck is exceedingly dangerous. It therefore seems probable that in this case we had, when the knife passed through the fistula, a reflex inhibition of the heart, stopping it permanently. After death the heart was found "empty and firmly collapsed." The phrase "firmly collapsed" is ambiguous, but evidently means "firmly contracted." It points to a paralysis of the cardiac ganglia rather than to any paralysis of the cardiac muscle itself. In the lower animals the heart is in diastole after inhibition of the vagus.

The great object of chloroform being not only to abolish sensation, but also to suspend the conduction of reflex impulses, we now see how dangerous a little chloroform is, when any nervous stimulus by means of an operation is going on. If reflex action be not suspended by the chloroform, then the patient is in immi risk, and the result may be as disastrous as in this instance.

How deeply the belief has sunk into the minds of many chlo form administrators, that the patient is safe in inverse ratio to amount of chloroform given, may be gathered from the fact, th in spite of the distinct warnings of Syme, Lister, and Laud Brunton, as to the dangers of a little chloroform, we still read its sparing administration, under the delusion that it is in this wa less dangerous. When a patient is put under the influence chloroform so as to paralyze his respiratory centre, he is in a ver critical condition, but he is in even more risk of loss of life if t operator cuts when reflex action is in full swing, and only sensati abolished.

To this explanation, however, two objections may be urge In the first place, it may be said that deaths should be frequent cases where operations are performed without chloroform. Her we have, according to this theory, reflex inhibition of the hear and yet deaths are rare. May it not be the case that even th small amount of chloroform given in such a case as that recorde above proved fatal? How is it, indeed, that a patient, undergoin an operation while insufficiently chloroformed, runs more risk death than if no chloroform had been administered? The answe to this objection seems to be afforded by experimental physiologists, who have shown that there exists a centre for the inhibition of reflex action. After this centre is destroyed, th reflex response to stimulus is more marked and occurs after a shorter time; and when stimulated, the response to irritation occurs after a longer period. (Foster's *Physiology*, page 474). It would, therefore, appear that a person undergoing an operation without chloroform has the wonderful power of inhibiting reflex impulses. Under chloroform this is lost, and, accordingly, unless reflex action be abolished, the patient is in some risk, and in special cases in danger of death,[1] from reflex inhibition of the heart. Another fact from which the advocates of small doses of chloroform draw comfort is, that in obstetric practice, where chloroform is almost always given until only sensation is abolished, deaths are never heard of, although very violent stimulation of sensory nerves is going on. Such a fact has no bearing on the present case. We do not know why parturient women seem never to suffer from shock after birth. The pain is terrible, but yet after the child is born the patient is generally in a normal condition. May it not be that there is in parturient women some extra development of their centre for the inhibition of reflex action, and therefore the absence of shock? Chloroform is a drug so useful and widely used that we cannot criticise too carefully all alleged deaths from its use. The widely prevalent opinion seems to be, that it only kills when given to excess. We hope we have shown t it is as dangerous to give it too sparingly in any operative case ; that in patients with weak hearts, the only safety is to give it rt of affecting the respiratory centre.

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[1] See also *Brit. Med.*, 4th Dec. 1875, p. 696.

Ve have not discussed the question whether or not the respira- y centre may be paralyzed by any sudden nervous shock. Pro- ly it can ; but the facts are not so well ascertained as in the case the heart. Nor shall we discuss how a weak heart could be so nly collapsed after death as it was in this case. We hope that loroformists will keep before their eyes the facts and explana- ns we have advanced, and be as careful in abolishing reflex ion as they are in watching that the respiratory centre is not ected.

In every death while chloroform is being used the whole cir- mstances should be considered, and the fact—hard, no doubt, for jury to grasp—kept in mind that a little chloroform is sometimes ore dangerous than too much; and that every death during the ministration of chloroform need not be a death from its adminis- ation.

RTICLE VI.—*Case of Ascites Cured by Paracentesis and Compression.* By Dr A. X. LOPES VIEIRA. Translated from "Estudos Medicos de Coimbra" University, Portugal, by JOHN BOYD, M.D., Slamannan.

HE patient to whom I refer, a woman of above 30 years, single, eak in constitution, and of mixed temperament, came to consult ne in May 1877, presenting the abdomen extremely voluminous, iving evidence of a most abundant liquid effusion in the peritoneal avity, which gave rise to an extraordinary distension and thinning f the abdominal parietes, and repulsion of the floating ribs. Per- ussion demonstrated the extension of the liquid to a much higher evel than where the diaphragm and thoracic viscera are usually ound, producing an extreme elevation and compression of these rgans, the functions of which were seriously compromised. The dyspnœa was considerable, and the patient complained of the difficulty with which the stomach received food, which was frequently expelled, and tolerated only in small quantities.

The excessive volume of the abdomen, and the state of forced distension of its parietes, render locomotion very painful.. Nothing else abnormal could be observed in this case, nor was anything else alleged, as urination inclusively was regular.

She related, that nine years previously she began to perceive an increased size of the belly, and could assign no cause for this appearance; the region in question took larger proportions, notwithstanding the various medicines and frictions that were used. At the same time the divers inconveniences resulting from this tumefaction still increasing, reached the point at which she came under my observation. I regarded the patient as affected wit ascites, and suspended my opinion as to its character—essential symptomatic—from it being impossible for me to satisfactor examine the condition of the organs included in the abdomin cavity, of the lesion of one of which the ascites might be symptomatic.

This diagnosis being made, I deliberated as to the application paracentesis. The immediate application of this method, althoug generally regarded as palliative merely, was indicated to me—1s By the anxiety and thoracic respiration in which I saw the woman; 2d, By the convenience of reducing the abdomen to the state i which exploration was possible; 3d, and finally, That little o nothing was to be expected from evacuant agencies (diuretics laxatives, or diaphoretics) in a case wherein existed the necessity for expelling an enormous quantity of liquid. I made the paracentesis, and by that means extracted from the patient's abdomen about 30 litres of a serous fluid presenting all the ordinary characters, and succeeded in exhausting, as far as possible, the peritoneal cavity, having to deal with ascites in the highest degree. The examination of the abdominal viscera I subsequently made convinced me of the absence of organic lesions corresponding with the want of such indications as I had previously suspected. In view of this, I considered it highly probable that the ascites was *essential*, due to the action of cold acting externally or internally. and not supplementary to a suppressed fluxion—a hypothesis not at all applicable to the present case.

Ultimately I employed every diligence in causing the patient to be wrapped up in such a way that a very sensible compression was established all over the abdominal region, recommending further repose in bed for several days, keeping up always the same degree of pressure over the bowels. Neither syncope nor any other unpleasant accident supervened, and at the end of seven days the patient rose and commenced to take moderate walks. She continued always to go well bound, and began to take a restorative diet, avoid exposure to cold, and abstaining from work.

In the August of the same year, 1877, she again came under my observation, and I noted with great satisfaction that the abdomen had not augmented in the least, nor presented the slightest sign of the effusion being reproduced. She still continued to make use of the abdominal ligature. Encouraged by this result, I then conceived the hope of making a radical cure of the malady, but dreading a relapse from the access of the winter's cold and damp, I recommended the patient to use sea-bathing in September to the extent of twenty short cold baths—a counsel which she scrupulously followed out. After several baths she began to slacken the abdominal ligature—continuing still well. On returning home from the coast she found herself stronger, and continued not to exhibit the slightest sign of abdominal effusion. Nine months have v elapsed since the operation, and she considers herself cured, ls herself vigorous, and able to resume all her habitual occupa- ns.

Observations.—The diagnosis of essential ascites appears to be nfirmed by the absence of relapse, which must have inevitably en place if an organic lesion existed, of which it was sympto- tic. The ascites, which attained an extraordinary grade, as licated by the enormous quantity of liquid evacuated, has been finitively cured. How explain the obtained result, and to what it attributable? Paracentesis itself could hardly affect this result. suppose so, it would be necessary to admit that the observed usion was produced at a previous time, in virtue of a fluxion or secretory irritation of the serous peritoneum, due to the action of ld, ceased and disappeared spontaneously afterwards—this effusion isting merely as a consequence, which, once extinguished by the ncture, had no power to reproduce itself. Such is the only eory which appears to me capable of thus explaining the fact. If is allowable to accept it in the present case, it does not thereby ase to be truly remarkable, inasmuch as such a hypothesis infers ith it the possibility of the cure of essential ascites by paracentesis, hich in general is *not* observed.

If this explanation be rejected or held as insufficient, to what are e to attribute the cure? As far as I can see, it is rather to the *ergetic* and *continued* compression that the result is due in the ase in question. We can easily understand how, being employed fter the complete evacuation of the hydropic fluid, it secures a egular and thorough pressure over the serous peritoneal surface by neans of the abdominal parietes and the contained viscera. It hus comes to regulate the abdominal circulation, and to counteract he capillary congestion, which brings with it the serous exudation. Now, the employment of compression as a treatment of ascites is not a novelty. It is known to have been applied by Munro in the middle of last century, and later on published by Récamier, Hussan, Godille, Speranza, Federigo, Demondeau, and principally experimented on by Bricheteau. However, if Velpeau, Bouillaud, and Andral actually concede to it a certain value (as stated by Gintrac in "Jaccoud's Dictionary"), it is almost wholly omitted in the special pathological treatises most read by us. Nevertheless Grissole takes notice of the results obtained by Bricheteau, and gives, as demonstrated by him, the "utility of compression in seven cases of simple ascites, uncomplicated with organic lesions, or any obstacle to the circulation."

In the case now described, a fact is obvious as corroborating the importance of compression in simple ascites, namely, the *exaggerated grade of the malady*, the *promptitude of the recovery*, and the *exclusive action of the compression*, after the paracentesis, without the aid of any other therapeutic agency.

As to the general cold baths, the cure can in no way be attributed to them, inasmuch as the patient had been operated u three months before their use, and then found herself free from disease. I consider, nevertheless, that cold general baths, w suitably applied, constitute one of the most powerful measures p ventative of a relapse of essential dropsies.

ARTICLE VII.—*The Course of Diphtheria in Two Brothers al simultaneously stricken:—A Clinical Study.* By Sir JOHN R CORMACK, F.R.S.E., M.D. Edin.; M.D. Paris; Fellow of t Royal College of Physicians of London; Membre de la Soc Clinique de Paris; Physician to the Hertford British Hospit of Paris; Chevalier de la Légion d' Honneur.

(*Continued from page* 637, *vol.* xxiii.)

FIBRINOUS deposits plugging or more or less occupying bronchial tubes have been loosely described in several scientific mem as pseudo-membranous formations,—a circumstance whic has greatly obstructed the study of the point now under consideration. They may, nevertheless, always, I think, be readily distinguished from one another. At the first glance, no doubt, a arborescent fibrinous deposit, moulded within and dragged gent out from the air-tubes, looks very like the pseudo-membrano arborescence found at the autopsy in the case of Henry Stock, fro which, however, it essentially differs in not being caniculated. I Henry Stock, the "arborescent bunches" were "tubular." Fibrino deposits plugging, or more or less obstructing bronchial tubes, ar solid; they have not the histological characteristics of fals membrane. False-membrane formed on the mucous lining of th air-passages is a tough stratified pellicle, composed of layers o cacoplastic lymph, in which epithelial cells are embedded. Are the bronchial pseudo-membranous formations now being considered manifestations of diphtheria only, or also of another disease o supposed disease, called in systematic treatises "pseudo-membranou bronchitis" and "plastic bronchitis?" That is the question.

The cases in which fibrinous deposits take place in the bronchial tubes are totally different in their etiology and character from those in which pseudo-membranous formations occur. Fibrinous deposits in the bronchial tubes are only met with in isolated cases of pulmonary congestion or inflammation, and are the results of sanguineous effusion. Pseudo-membranous deposits in the bronchial tubes occur much more epidemically than sporadically; they belong to a malady which is unquestionably contagious; and, lastly, they are often associated with and followed by paralytic affections. These statements do not absolutely negative the assertion that pseudo-membranous bronchitis may follow exposure to cold and damp. In such cases, however, the affection immediately determined is simply arrhal—the pseudo-membranous affection being secondary—an grafting of the specific pellicular disease upon the original non-ecific inflammation, just as we sometimes see diphtheria engrafted on a simple laryngitis. During the prevalence of an epidemic of htheria, or as the result of exposure to the contagion of that ease, simple cynanche, resulting from exposure to cold and damp, exceedingly apt to become pellicular, a circumstance which has be carefully kept in view in studying the etiology and treatment all cases of sore-throat.

Barth reported, in 1852, in the *Bulletin de la Société Anatomique* Paris, a case which he calls *pneumonia*, in which the patient ected a caniculated arborescent false membrane. Was it not a se of diphtheria?

Nonat describes a peculiar epidemic, which he calls *influenza* *rchives Générales de Médecine*, t. xiv. 2re Série), in which the rmation of false-membrane on the mucous lining of the bronchial bes was a common complication. Has not Nonat unawares escribed a peculiar epidemic of diphtheria?

The statements of Barth and Nonat are only cited as specimens many recorded clinical observations, standing forth prominently apparent opposition to the doctrine that plastic or pseudo-memranous bronchitis is a variety of diphtheria; and that in no other isease except diphtheria is the plastic pellicular membrane formed n the mucous surface of the air-passages. They are also cited to how the wideness of the clinical inquiry—the minuteness of oberving and reporting—which will have to be instituted before the athological question now mooted can be solved.

4. *The Pulse.*—In acute diphtheria, the pulse is generally quick nd feeble; but there are cases in the course of which it becomes emarkably slow, the change sometimes occurring suddenly. It is mportant to observe the circumstances in which this slowness of ulse occurs, and to understand that it has not always the same prognostic significance.

In the second case, Tuesday, 14th August, was an anxious and also a hopeful day. Had a prognosis been then formed from the temperature and the pulse, irrespective of the indications afforded by other symptoms, it would have been exceedingly unfavourable. The temperature was 36°·2 C., that is, eight-tenths of a degree below the normal standard; and the pulse was slower than it had yet been, viz., 54—a very slow pulse in any one, but particularly slow in a child. The pulse was also exceedingly weak—weaker, perhaps, than it had yet been. It is important to note, that together with the abnormally low temperature and pulse, there were decided appearances of amendment, which, as the event proved, were not illusory. The low temperature and the low pulse unequivocally showed that the patient was in a very hazardous state, and that to maintain the circulation adequately he required to be kept warm and in the horizontal position, food and stimula judiciously selected and apportioned, being at the same time a- ministered at short intervals. Nevertheless, under certain rese the prognosis was favourable. The sweating marked the subside of the special action of the poison-disease, and the fall in t temperature and pulse were the inevitable and probably o temporarily depressing effects of that critical evacuation. I ha several times seen diphtheritic patients make good recoveries af the pulse and temperature had become suddenly lowered; but the patients to whom I refer, the sudden fall of pulse and temperature was co-incident with, and no doubt was a consequence of a critical sweat or a critical diarrhœa. I recently attended a you English lady in a severe attack of diphtheria, whom I left at n o'clock one night with a dry skin, a temperature of 38° C., and a pulse of 112, and whom I found next morning at ten o'clock w a temperature of 36°·5 C. and a feeble pulse of 48. She wa sweating profusely, and in an alarming state of prostration. F forty-eight hours her condition was exceedingly critical; but she was carried through that period by careful nursing and the free us of a mixture of brandy and champagne. In a few days he recovery was progressing rapidly; it was soon complete. She ha no paralytic sequelæ, except that which was indicated by a slig nasality of voice, which only continued for about seven da Throughout her illness and convalescence this patient took ir and strychnia and a large daily allowance of claret.

With the modification implied in the remarks now made i respect to the temporary nature of the depressing influence critical sweating and purging, the pulse of diphtheria is th correctly described by Sanné. He says:—"The pulse is generally quick in acute diphtheria, rising to 120 to 140, or even higher, according to the age of the patient. Though relatively higher, the pulse, nevertheless, follows the temperature in its ascent, and then falls even, but not always with a parallel descent. The pulse often continues to be rapid for some time after the temperature has returned to its normal state. When a complication supervenes, the pulse follows the phases of the complication. In the malignant form of the disease, and in cases of the infectious forms terminatin in death, the pulse sometimes becomes miserably small, and suddenly falls below 50—a very slow pulse, particularly in a child."

Dr Greenhow remarked, at a discussion at the Clinical Society o London, reported at p. 192 of the *Transactions* of 1872:—"The slowness which set in about the seventh day of the illness, when the throat affection is subsiding, is another symptom which has been observed in many cases; and in several of these I have seen the pulse become slower and slower from day to day, until at length the patient has died, apparently from failure of the heart's action." Remarks to the same effect, on suddenly supervening slowness of pulse, have been made by many writers.

At p. 278 of the second volume of my *Clinical Studies* (London, 76), I say:—"In all cases of diphtheria, and in all stages of the ease—even during an apparently satisfactory convalescence—lure of the action of the heart is an ever-to-be-dreaded cause of ath. In many cases it is impossible to guard against it by the nost watchfulness and the highest exercise of professional skill. the other hand, by judicious care, sound precautions, and tional treatment, cases of extreme cardiac debility are frequently ided to complete recovery." In the course of farther remarks on e same subject, I have described an example of death occurring sud- nly in diphtheria, on the fifth day of the disease, from failure of the art, caused apparently by the action of the specific poison on that gan. In the same discussion, I mention the sudden death of another my diphtheritic patients, an English girl, aged 11. When she ied, a month had elapsed since the first manifestation of the dis- se: its acute symptoms had passed away, and although there still mained great debility and emaciation, with a slight and perhaps creasing difficulty in swallowing liquids, a visible improvement in e countenance was taking place from day to day. It is interesting nd instructive to study the history of these two fatal cases in con- unction with the history of the illness and recovery of Thomas tock.

In 1846, Weber announced the interesting fact, since confirmed y subsequent observers, that irritation of the pneumogastric nerves etards the action of the heart; and in 1859, Czermak announced that he could reduce his own pulse to one-half its normal rate by carefully pressing the trunk of that nerve against a hard lump in the neck, which was probably a vertebral exostosis. Certain drugs—according to the state of the patient to whom they are administered, and the dose—also produce slow pulse, more or less paralysis of the heart, or death from arrest of the contractions of that organ. Sometimes the poisons exert their influence on the roots of the nerve in the medulla oblongata, and sometimes on the peripheral extremities of the heart and other localities. Certain morbid poisons, likewise, act in the same way on the cardiac, pulmonary, gastric, œsophageal, and other peripheries of the vagus, producing slow pulse, dyspnœa, vomiting, dysphagia, and other characteristic phenomena. The paralysis which complicates or follows so many attacks of diphtheria and other diseases, is often probably due to the presence of a morbid poison in the blood acting as an irritant of the peripheric extremities of the pneumogastric nerves.

Slowness of pulse and the other paralytic affections of diphtheria do not usually occur till the first explosion of the disease is subsiding, and generally not till apparent convalescence is far advanced. In diphtheria the pulse is generally for some days abnormally rapid, though very weak. It is seldom till a later stage that an alarming slowness of pulse shows itself, and then it is generally associated with other paralytic manifestations. Thomas Stock was showing signs of dysphagia when his slowness of pulse created anxiety. In a large majority of the cases of diphtheria, in which paralytic affections occur, a certain time has generally elapsed before the paralysis shows itself; usually, indeed, convalescence progressing, and is often apparently even near its completion. Is the paralysis occurring in this large group of cases toxæmic—is due to the diphtheritic poison acting through the blood upon the nervous centres—or acting in any way? If we answer this question in the affirmative, we are at once confronted with a problem of great difficulty. Upon what depends the retardation of the power of the poison of diphtheria to produce paralytic affections? If these later phenomena are toxæmic, why are they usually separated by days or weeks from the primary manifestations of the poison? If we declare the majority of the paralytic affections to be toxæmic, we state that there is an inherent suspended power in one and only in one of the actions of the poison. To state this is to admit the existence of a mystery, of which it is impossible to give an explanation based upon known pathological facts or analogies. In the cases in which the paralytic affections show themselves very early in the attack the toxæmic explanation is quite reasonable.

The irregularity and slowness of pulse—like the various paralytic affections of diphtheria—often occur at a considerable interval after the subsidence of the first explosion of the disease, when recovery is far advanced, or even when it is apparently complete. These secondary manifestations of impaired nervous power are certainly met with much more frequently in diphtheria; but in studying this subject it is important to remember that a similar reserved morbific action shows itself in other diseases. This reserved morbific action has, for example, been observed as a characteristic of some epidemics of influenza, another specific disease which, like diphtheria, occurs endemically as well as epidemically. Several very remarkable cases of this kind have come under my notice. In a former paper, I illustrated at some length the subject of paralysis occurring during convalescence, and after apparent recovery from various acute and exhausting maladies.

It will be more convenient to reserve the farther consideration of the causes and treatment of diphtheritic paralysis, as the cases described in this paper do not afford the necessary illustrative materials.

ARTICLE VIII.—*Tubercular Leprosy.* By J. LABONTÉ, M.D., M.R.C.P. Edin., Mauritius.

(*Continued from p.* 228, *vol.* xxiii.)

ANOTHER form of leprosy just as common as that which we considered previously is characterized by quite a different set of symptoms. As regards appearance it is not so loathsome, there re ordinarily no tubercles, crude or in suppuration, none of those ightful complications we noticed before, and the countenance as nothing of the leonine appearance so characteristic of tuber-ular leprosy. The disease, nevertheless, is just as severe in its ffects, the patient being almost invariably rendered helpless. Vhen it first sets in, bullæ show themselves principally on the ands and feet, fingers and toes, where, after a short time, they urst and leave behind ulcers which generally heal up quicker han in the other case, save those which are on the plantar aspect f the foot. Accompanying this there is numbness varying in legree and extent, and, if a close inspection be made at the time, here will invariably be found on the extremities discoloured atches of skin of a dull white or waxy yellow hue, having in some instances a scaly appearance and in others a sort of metallic lustre. Like patches are not uncommonly met with on the face also. Muscular atrophy, which, perhaps, is the earliest symptom in this form, is now apparent, and it progresses steadily, involving the extensor muscles of the hands principally. First and foremost, the little and ring fingers are flexed, and next the remaining fingers, flexion beginning at the distal phalanx to extend gradually to the second and first, until the hand becomes unserviceable in the course of time. Ulceration very often sets in at the joints, and in such cases the phalanges drop off in succession, reducing hands and feet to mere stumps. Such is the wasting of muscular tissue in this form, that the palm of the hand, at an early stage of the disease, is converted into a large cavity, of which the inner and outer borders are brought into close proximity, and that by touch and sight very little is seen or felt except skin and bony tissue. Muscular atrophy is not, however, general in all cases, but is mostly confined to the extremities. The countenance as a whole is seldom much altered, save where from paralysis there is eversion of the lower eyelid, the eyes being then watery, and light not easily tolerated, dragging of the face to one side or to the other, with the appearance of premature old age from wrinkling of the skin due to muscular atrophy. Blindness often supervenes in cases of this sort; such a complication, however, is happily not the general rule, but the exception; for patients suffering from "atrophic leprosy," as I am in the habit of calling that variety of the disease, may be constantly seen going about begging in the enjoyment of apparent good health, walking on their heels, their hands reduced to mere rudiments, but the rest of their body yet comparatively sound. On inquiry, it will be found that they feel no pain; but all complain of being miserable, from being deprived of the means of ready locomotion and the free use of their hands, their appetite, sleep, and general health being by themselves considered satisfactory. Save tactile sensibility and muscular sense, I have seldom seen that the other special senses were in any way affected. There may or may not be falling of the hair and of the eyebrows, and just as in tubercular lepr the form we are now considering is to be met with in both se irrespective of age, its evolution being, however, slower a attended by less discomfort and physical suffering. Spontane cure does happen, as manifested by what has just been said street-beggars, and in this variety of the disease such instan are much more frequent than in tubercular leprosy. Typi cases of atrophic leprosy are not rare; but we constantly s mixed cases, which makes it difficult to determine positively whe one variety ends and the other begins. Thus, I know cases whe the offspring is suffering from tubercular leprosy, whilst t parent has "atrophic leprosy." I must not pass over two oth varieties of skin disease known here by the name of "white a black leprosy." So far as I am aware, from information gathe from patients labouring under each of those forms of the diseas it would appear that there is no physical suffering, but a good d of annoyance caused by the fact that, in the course of time, t patient in one case may be completely turned from black in white, as I have myself seen a few instances, and in the oth from olive or brown complexion into black, as I have also se My experience in this matter is, however, not sufficiently gre to warrant that I should extend further at this moment; but I am under the impression that the disease is one of nutriti whereby in one case pigment is deficient, and in the other in excess. This might, perhaps, be accounted for by some impairment in the functional activity of the vaso-motor system of nerve It is not my intention to publish all the cases of tubercular o atrophic leprosy I have either seen or treated, because I would b going beyond the limits I set in the beginning; but I will publis notes of a few cases taken from amongst many to illustrate th different varieties of the disease, and to support the views I entertain. Nor do I intend giving notes of far advanced cases because when speaking of the treatment I must incidentally allude to those cases on account of their complications. And first, in illustration that the disease is mostly hereditary, the following cases may be considered as fair examples of the general history of many placed in similar circumstances:—

Case I.—Mr ——, 14½ years old, a white creole. *History.*—Seven years ago a purple-looking blotch showed itself on the right buttock, one year afterwards another blotch of exactly the same sort appeared on the opposite side. At that time the patient was treated both internally and externally. For some years he was under quacks, whom he blames for the spread of the disease in his case.

Actual Symptoms, April 1871.—Face much swollen, tubercles seated in the ears, chin, and upper lip. Ears uncommonly large and thickened. Hair falling off abundantly, eyebrows gone, eyes

ghtly injected, eyesight tolerably good. Leonine appearance lerably marked. Tubercles and ulcerations in the nostrils, eathes with difficulty, occasional epistaxis. Throat and uvula cerated and painful, voice impaired, olfactory sense paralyzed. hest and back covered with patches characteristic of the disease. mall ulcerations on forearms and on left little finger, hands vollen. Large cluster of tubercles on the buttocks, not quite so rge on the knees. Left foot swollen with ulceration of two toes. econd toe of right foot begins to ulcerate. Sensibility good in me regions of the body, blunt or gone in others. Appetite tolerbly good. Digestion bad, with more or less diarrhœa. Sleeps, ut only in a semi-recumbent position; loud snorting whilst sleep; patient breathing by the mouth. No cough. Slight nlargement of glands at the groin. Lungs and heart healthy. ather is suffering from the disease in its last stage. One sister ied of the same disease.

Note.—Besides those mentioned above, I knew other members f the same family who suffered from the same disease, and others vho looked perfectly healthy. Leprosy in this case extended to oth male and female children.

CASE II.—Miss ——, a creole, 24 years of age. *History.*—Was wice vaccinated with success. General health was always good. No disease of any consequence in infancy. Was born in a country district, where she has always resided. Mother died of fever at a great age. Father alive and in perfect health. Were twelve in the family; a brother died of leprosy at the age of 26, disease having lasted six years. Twelve years ago two white patches appeared on left cheek. Was then treated by lotions, and for two years took a syrup of some sort which was given her by a quack. From left cheek those patches spread to right cheek, and for the last six months the disease has spread generally.

Actual Symptoms, October 1871.—Face much swollen, cheeks covered by tubercular patches, spreading from the lower eyelid to the upper lip, and transversely from the ear to the wing of the nose. On the left another patch separated from the former by a finger's breadth occupies the submaxillary region, and extends down to the level of the thyroid gland. Those patches are of a purple hue, five or six lines in thickness, and insensible. On the right wing of the nose there are a few small tubercles; they are larger and more numerous on the forehead, chin, and upper eyelids. Ears swollen and infiltrated, with tubercles in all their extent. Left ear at least double the right. Eyebrows have not fallen off. Hair falls off. No leonine appearance. Eyes clear, eyesight good. Breathes through her nose, no epistaxis, no tubercles in the nostrils, sense of smell good, palate and throat sound, voice clear, sense of taste perfect. Neck swollen. A few small tubercules on the back, chest, and left breast. Arms much swollen, infiltrated with tubercules from shoulders to fingers, varying from the size of a small pea to a small nut. There is besides a large tubercular patch the same colour and thickness as on the face at the inner surface of the arms, extending from the lower half of the arm to the upper half of the forearm. Sensibility is blunt in them. Fingers move freely, tactile sensibility good. Patient can sew, but feels a kind of numbness in her hands. The inferior extremities are completely infiltrated with tubercules, the largest being on the buttocks, thighs, knees, and calfs. Right foot is more swollen than left. No swelling of the lymphatic glands. Appetite good. Sleeps well, catamenia regular, nothing abnormal at heart or in the lungs.

Note.—I have seen the offspring (a girl) of one of the patient's brothers, a stout and strong built man, enjoying perfectly good health, married to a woman equally stout and healthy looking, take on the disease at the age of eight.

(*To be continued.*)

ARTICLE IX.—*The Sewage Question.* Number VII. By ANDREW FERGUS, M.D., Glasgow.

(*Continued from page* 339.)

THE extract from the Report to the Local Government Board, with which the last article concluded, has at least one recommendation, viz., that it is not nearly so enthusiastic in favour of sewage irrigation as some of Mr Rawlinson's former utterances. Of course, sewage irrigation is to a certain extent approved of, and recommended, but this is done cautiously, and care is taken not to lead local authorities to expect paying results. No one can object to such an opinion, moderately expressed, when it is not calculated to mislead by a too glowing description; still the Report is in various points unsatisfactory.[1]

In considering the details of the Government Report a great fault crops up. Any one occupying the responsible position of a Government reporter should surely state fully and plainly all facts bearing on the subject under consideration, irrespective altogether of the writer's own individual opinions with regard to

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[1] I am not alone in holding this opinion; Messrs Robinson & Melliss say, "The report of a committee appointed in June 1875 by the Local Government Board to inquire into the several modes of treating town sewage, has recently appeared, and a considerable amount of information has been collected by this committee. Valuable as is the matter brought together in these publications, it is not in a form which can be utilized by sanitary authorities." In the *Society of Arts Journal*, there is a still more adverse criticism of the manner in which the Liernur system is considered in the Report, to which reference may be made when we come to consider that system.

Town.	Population.	Flow of Sewage.		Volume Sewage		
		In Gallons Daily.	In Tons Yearly.	Per Head.	Per per	
I. By Irrigation.				Gals.		
¶ Altrincham,	9,000	250,000	...	...	..	
Banbury,	12,000	320,000	521,585	27		
¶ Do.	11,718	320,000	...	...	..	
Bedford,	18,000	700,000	1,140,625	89		
¶ Do.,	16,851	700,000	...	...	..	
¶ Bishop Stortford,	6,250	500,000	...	...	..	
Blackburn,	90,000	1,500,000	2,444,040	17	1	and purchased a
¶ Do.,	83,000	1,500,000 (⅗ths only)	...	...	..	
Cheltenham,	45,000	1,250,000	2,086,700	28		nd rates. Land sset.
¶ Do.,	41,923	1,250,000	...	...	..	
Chorley,	20,000	500,000	814,680	25		nd rates. Land sset.
¶ Do.,	18,000	500,000	...	...	..	
¶ Crewe,	20,000	900,000	...	...	..	
¶ Croydon,	57,000	3,000,000	...	...	..	
Doncaster,	20,000	600,000	977,470	30		es.
¶ Do.,	18,750	700,000	...	...	..	
¶ Epsom,	6,276	104,000	...	...	..	
¶ Eton,	3,000	80,000	...	...	..	
Harrogate,	12,000	210,000	342,187	18	1	Land purchased a
¶ Do.,	12,000	210,000	...	...	..	
¶ Kendal,	13,442	500,000	...	...	..	
¶ Kidderminster,	19,463	1,120,000	...	...	..	
Leamington,	24,700	700,000	1,140,625	28		
¶ Do.,	24,000	800,000	...	...	..	
Merthyr-Tydvil,	55,000	1,200,000	1,955,305	22	1	d" asset.
¶ Do.,	*48,500	1,200,000	...	...	..	ng to sewage.
¶ Norwich,	84,000	...	...	...	..	
¶ Northampton,	45,000	1,000,000	...	...	..	
¶ Reigate,	15,916	480,000	...	...	..	
Rugby,	8,400	400,000	651,525	48		
¶ Do.,	8,400	400,000	...	...	..	
¶ Swindon (New Town),	7,628	300,000	...	...	..	Land purchased a
Tunbridge Wells,	23,000	650,000	1,059,230	28		
¶ Do.,	23,000	650,000	...	...	...	
Warwick,	11,000	700,000	1,140,625	64	4	
¶ Do.,	11,000	700,000	...	...	..	d" asset.
West Derby,	31,400	750,000	1,220,560	24		ng to sewage.
¶ Do.,	*24,100	723,000	...	...	...	
Wolverhampton,	71,000	2,500,000	4,073,400	35	6	od" asset.
Wrexham,	10,000	...	657,000	...	...	ks" by R. & M.
¶ Do.,	8,537	300,000				
II. By Precipitation.						good" asset. Law
Birmingham,	350,000	12,000,000	19,553,415	34	6	
¶ Do.,	350,000	12,000,000	...	...	...	
Bolton,	93,100	2,500,000	4,073,765	27	8	only treated.
¶ Do.,	93,000	5,000,000	...	...	...	
Bradford,	173,723	8,000,000	13,035,610	46	5	
¶ Do.,	163,056	8,000,000	...	...	...	
Coventry,	40,000	2,000,000	3,250,370	50		od" asset.
¶ Do.,	40,000	2,000,000	...	...	...	
Leeds,	285,000	12,000,000	19,553,415	42	6	
¶ Do.,	245,000	9,000,000	...	...	...	
Halifax,	68,000	2,500,000	4,073,400	37	6	nci-
Rochdale,	67,000	1,250,000	2,036,700	19	12	col- and anu- } Manure valued at £1 per ton, but there is not a ready sale for it.
III. By Discharging into the Sea.						
¶ Brighton,	100,000	2,500,000	...			nance, venti-

Now, in the table, p. lviii., and in the details of the several places ntioned in the table, sufficient care is not taken to point out to e reader that in the dry methods, the ashes and dry refuse are so removed. The quantity given in the tables indicates that ch is the case. In all the places where there is irrigation or recipitation and no mention of ashes, the cost should be loaded ith the expense of the removal of all dry refuse before a correct stimate of the costs of the different systems can be arrived at. I ave already spoken of the difficulty of getting a correct estimate f the costs and results of sewage irrigation, and the longer I study the question, and the more I consult writers upon it, the difficulty only seems to increase. To put this difficulty before the reader in the clearest manner, I give a table (No. I.), compiled from the Government Report, and also from Messrs Robinson and Melliss' book. A careful study of this table will, I think, amply prove what I have said, though I cannot explain and do not understand how such discrepancies can arise. In the very important question of the cost per head and per pound there ought to be no difference, yet only in one place (Rugby) is the cost stated as the same by both writers, 1½d. The preconceived opinion of the authors, or, what is even worse, a desire to act as special pleaders for their own views, has evidently had great influence with them, and renders their conclusions of much less value. Mr Rawlinson inclines to irrigation, and puts the case as favourably as possible in behalf of this system. In some places where it has been adopted the rates appear light, because the cost of the removal of the ashes is not included, while in the account given of processes employed in other places the cost of removal is included. At page lviii. of the Report to the Local Government Board there is a table of comparison of the loss of disposing of town sewage in proportion to the annual rateable value of the town. All the particulars in this are given in Table No. I. (marked ¶), with other particulars gleaned out of this Blue Book. It should be mentioned that each process is plus scavenging, which I suppose means that street and surface cleansing is not charged. This is confirmed, if we look at the details of each place, while no mention is made of any charge for surface cleansing, nor for removal of ashes, except in a few cases specially noted in Table No. I. But the dry refuse consisting of ashes and all kinds of household garbage must also be removed, and the doing so must cost money, which, if it was added, would probably make the cost of irrigation quite equal to that of other processes. If the reader will study the table he will find there is no mention of ashes, and the rates very light, till he comes to Blackburn. In that place the ashes are included and the rates are very high. Cheltenham, however, shows a different state of matters, as there the ashes are included, yet the rates are very low; again, at Chorley, the ashes are included and the rates are high. At

Merthyr the privies are cleansed by the occupiers, and although not stated, it may be assumed that the same parties remove the ashes. Norwich, Leamington, and Tunbridge Wells, are the only places in the Blue Book where the rates per pound are high, viz., 6½d 7½d., and 10d., and where there is no mention of ashes. No doubt these high rates would be augmented if the cost of the removal of dry refuse was included. In speaking of Warwick, it may be remarked that, in the *Times* for 16th August 1875, there was a table of the working of sewage farms which have been in operation for one year and upwards, and in it Warwick was represented as the only town which showed a large profit, viz., £1381. All the other towns, twenty-five in number, showed a loss, except Swindon which was credited with £12 profit. This table gave rise to some correspondence, several writers holding that the results given were unfair towards irrigation, and others calling them too favourable, *inasmuch* as interest on past expenditure, *i.e.*, capital, was not charged. Mr Clifford of Warwick (*Times*, 16th August), gives full and detailed tables of the expenditure at Warwick, and remarks upon them as follows: "From this it may be seen, that so far from a profit on the farming operations, there has been a heavy loss, and that excluding all other charges from the account, the losses for the last four years have been as follows: viz., £547, £754, £540, and £423 respectively. The total net expenditure to September 1874 has been £21,646; of this sum about £11,500 has been borrowed, the balance having been paid out of the rates, as well as the annual instalments in liquidation of the loan. How grievously this presses on the ratepayers of poor towns of 11,000 like Warwick may be readily imagined: the Board of Health rate is now 4s. 6d. in the pound, the borough rate is 1s. with a heavy poor-rate.

As sewage is constantly being formed, it must as constantly be removed, and as farmers will only use it when they need it, and can apply it with advantage to their land, they cannot be depended upon to use the whole sewage of a town. This, of course, compels local and municipal authorities either to buy or lease ground—in fact, to become farmers themselves; and as the towns increase in population, the ground held must from time to time be increased, and this is often very difficult. Indeed, in regard to some towns it is affirmed, that although Acts have been obtained for the purchase of land, they have remained dead letters, because no land could be purchased to carry out this process.

Let us now glance at the effect of irrigation on the sewage. As a general rule, suspended matters are nearly entirely removed by irrigation, but these are not the most polluting, neither are they dangerous to health. The matters in solution are also of the highest manurial value, and every process for sewage purification must be judged by the amount of the soluble matter removed, more especially of the organic matter held in solution. I have already menoned Dr Letheby's unfavourable report as to some effluent water. now give a Table taken from Dr Frankland's *Experimental esearches*, pp. 806–8.

TABLE II.

SUMMARY OF EXPERIMENTS ON THE PURIFICATION OF SEWAGE.

NAME OF PROCESS.	Percentage of Soluble Organic Pollution removed.		Percentage of Suspended Organic Pollution removed.
	Organic Carbon.	Organic Nitrogen.	
CHEMICAL PROCESSES.			
1. *Lime Process*:—			
Best result	36·1	65·8	96·8
*Worst „	23·4	10·4	59·6
Average „	27·7	43·7	80·6
2. *A. B. C. or Native-Guano Process*:—			
Best result	34·8	58·9	96·0
Worst „	25·8	50·1	87·4
Average „	32·1	54·3	92·0
3. *Lime and Chloride of Iron*	50·1	37·1	99·8
4. *Sulphate of Alumina*	3·8	48·0	79·0
UPWARD FILTRATION.			
5. *Through Sand* at rate of 3·6 gallons per cubic yard per 24 hours:—			
Best result	50·7	65·5	100
Worst „	·6	12·4	100
Average „	26·3	43·7	100
DOWNWARD INTERMITTENT FILTRATION.			
6. *Through Sand* at rate of 5·6 gallons per cubic yard per 24 hours:—			
Best result	84·9	96·9	100
Worst „	81·1	94·5	100
Average „	83·3	95·6	100
7. *Through Sand and Chalk* at rate of 5·6 gallons per cubic yard per 24 hours:—			
Best result	88·2	96·8	100
Worst „	84·3	95·9	100
Average „	86·7	96·3	100
8. *Through Beddington Soil* at rate of 7·6 gallons per cubic yard per 24 hours:—			
Best result	88·5	97·5	100
Worst „	87·6	96·9	100
Average „	88·0	97·2	100
9. *Through Hambrook Soil* at rate of 6·2 gallons per cubic yard per 24 hours:—			
Best result	80·4	92·9	100
Worst „	73·5	90·5	100
Average „	77·0	91·7	100

* This result was obtained at Blackburn, where the process is carried out in a most imperfect manner.

Table II.—*Continued.*

NAME OF PROCESS.	Percentage of Soluble Organic Pollution removed.		Percentage of Suspended Organic Pollution removed.
	Organic Carbon.	Organic Nitrogen.	
10. *Through Barking Soil* at rate of 3·8 gallons per cubic yard per 24 hours:—			
Best result	50·3	91·9	100
Worst „	·0	57·4	100
Average „	32·8	78·7	100
11. *Through Dursley Soil* at rate of 9·9 gallons per cubic yard per 24 hours:—			
Best result	87·6	95·4	100
Worst „	84·2	92·8	100
Average „	86·3	93·9	100
12. *Ditto* at rate of 12·4 gallons per cubic yard per 24 hours:—			
Best result	84·7	94·8	100
Worst „	64·8	82·2	100
Average „	76·9	88·3	100
13. *Through Leyland Peat* at rate of 4 gallons per cubic yard per 24 hours:—			
Best result	65·5	92·6	100
Worst „	47·7	49·0	100
Average „	51·1	59·1	100
IRRIGATION.			
14. *On Fallow Land at Chorley* (adhesive loam)	62·3	70·2	100
15. *At Edinburgh* * (both sand and clay)	45·3	81·1	84·9
16. *At Barking* (gravelly soil)	65·8	86·2	100
17. *At Aldershot* (light sand):—			
Best result	91·8	87·3	99·7
Worst „	69·9	82·9	87·7
Average „	80·9	85·1	93·7
18. *At Carlisle* (light loam)	77·9	59·8	100
19. *At Penrith* („ „)	75·0	77·2	100
20. *At Rugby* (adhesive soil)	72·3	92·9	96·0
21. *At Banbury* (principally clay):—			
Best result	87·8	91·3	96·0
Worst „	64·1	80·1	90·3
Average „	76·0	85·7	93·2
22. *At Warwick* (stiff clay)	71·7	89·6	100
23. *At Worthing* (loam)	42·7	83·5	100
24. *At Bedford* (light gravelly soil):—			
Best result	78·9	97·4	100
Worst „	60·5	70·8	100
Average „	71·6	81·3	100
25. *At Norwood* (clay):—			
Best result	76·1	92·0	100
Worst „	51·3	44·1	100
Average „	65·0	75·1	100
26. *At Croydon* (gravelly soil):—			
Best result	73·2	93·2	100
Worst „	61·7	90·4	100
Average „	67·4	91·8	100

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* At Edinburgh the cleansing of the sewage does not receive even a secondary consideration, and the operations are carried out in the most slovenly manner. Hence the comparatively imperfect purification here recorded.

From number 14 to 26 the reader will find the results of the nalysis at different places, and the kind of soil used is also mentioned.

Dr Frankland, in another page, states the average results of the whole of the different processes, as will appear from the following Table:— at the bottom of which are the parts bearing on irrigation. The difficulty of obtaining land, and the unsatisfactory results of sewage farming, coupled with the results of Dr Frankland's experiments, Table II., No. 6 to 13, led to the process which we shall next consider, viz., "Downward intermittent filtration," which has been carried out in various places chiefly by Mr Bailey Denton. It depends for its success on the oxidizing power of the air, and, as its name implies, essentially consists in the application of sewage intermittently to the earth, so regulated that one quantity of sewage is carried quite down through the earth before the next is applied to the surface. As the sewage passes down, all the air in the pores of the earth, which may be supposed to contain an amount of carbonic acid, and other results

TABLE III.*

SUMMARY OF RESULTS SHOWN IN TABLE NO. II.

NAME OF PROCESS.	Average percentage of *dissolved* Organic Pollution removed.		Average percentage of *suspended* Organic Pollution removed.
	Organic Carbon.	Organic Nitrogen.	
CHEMICAL PROCESSES.			
Best result	50·1	65·8	100
Worst "	3·4	0·0	59·6
Average "	28·4	36·6	89·8
UPWARD FILTRATION.			
Best result	50·7	65·5	100
Worst "	·6	12·4	100
Average "	26·3	43·7	100
DOWNWARD INTERMITTENT FILTRATION.			
Best result	88·5	97·5	100
Worst "	32·8	43·7	100
Average "	72·8	87·6	100
IRRIGATION.			
Best result	91·8	97·4	100
Worst "	42·7	44·1	84·9
Average "	68·6	81·7	97·7

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* From Dr Frankland's *Experimental Researches*, p. 809.

of oxidization, is forced out, and, as the water sinks down, fresh air will pass into the earth ready to unite with organic matter and in its turn be expelled by a fresh dressing of sewage; the energy of the earth as an oxidizer being thus renewed every time the sewage is re-applied and sinks down followed by the pure air. The kind of soil best suited for this process has been already mentioned; it must be completely and deeply drained, the underdrains being not less than six feet below the surface. When the process was first proposed, it was assumed that one acre of ground would be sufficient for 1000 people. This was reduced to 500, and again to 250 per acre. The ground is divided into three compartments, and the sewage turned on to each of them in succession. Thus, when one plot is in use, the other two are getting quit of the sewage by its percolation through the earth down to the deep drains. It has been proposed that it would be advantageous to plough up the compartments alternately every now and then, and raise a crop upon it, by which means the purifying power would be completely renewed. If the bed system is employed, root crops and cabbages may be grown on land actively employed in downward intermittent filtration. An objection to this process has been stated, viz., that much of the manurial value is lost; but I do not think that this has much force, as we must pay for being clean, and, if we befoul water, we must at any cost purify it before it can be returned into any river. Another objection is, that Dr Frankland's experiments were merely laboratory results, and that the same results would not be forthcoming in actual experience on a large scale. I shall quote from Dr Frankland's account of this process in the town where it has been most successfully adopted. At page 762 he says—"But the evidence of the efficiency of this process does not rest upon laboratory experiments alone. Intermittent filtration has been applied to the whole of the sewage of Merthyr-Tydvil. Twenty acres of a porous soil, drained from five to seven feet deep, have been here arranged by Mr Bailey Denton, C.E., in four series of beds; and over each series in succession the drainage water from a town of 50,000 inhabitants, more than one-third of whom are connected with the sewers, is poured for six hours at a time. The beds are laid out with a sufficient slope to carry the sewage (gradually sinking as it flows) from one side to the other within the allotted time, being thus irrigated from a nearly horizontal channel along the upper edge of each; and being left to drain and become aërated during eighteen hours of every day, they bring into successful operation the process of intermittent filtration on a very extensive scale. They are, moreover, cultivated, and large crops of cabbages have been grown on them; and no nuisance has arisen, of which we expressed some fear, if extensive filter-beds were made for the treatment of the sewage of any considerable town. These works have been carried out under an order of the Court of Chancery, directing the Merthyr-Tydvil Board of Health to abate the nuisance which the sewage of their town was creating n the river, and appointing Mr Bailey Denton to direct the necessary works. They were designed by Mr Denton expressly or the purpose of realizing on a large scale the results of that process of intermittent filtration which had been devised and investigated in the laboratory of this commission; and we have repeatedy inspected them, and on all occasions have found the effluent water purified to an extent much beyond that required by the standards of pollution suggested by us as those below which refuse liquids should not be permitted to enter rivers.

Dr Frankland gives a table of results and calculations, and then proceeds as follows:—"The Merthyr intermittent filters have proved that the application of the sewage of more than 1000 persons to an acre of land is consistent with the growth of crops and superabundant purification of the effluent water, and that the sewage of a much larger number of persons could be effectually purified upon an acre of land if the growth of crops were given up. In June 1871, when the sewage of about 1300 people was being applied to each acre, the effluent water was seven times as pure as needful. In October of the same year, when the number of persons per acre had been reduced to 500, the effluent water was fifteen times as pure as necessary; whilst in February 1875, when the number of persons per acre had diminished to 250, the effluent water was actually thirty times as pure as required by the standards. It must not be forgotten, however, in taking the Merthyr-Tydvil intermittent works as a model for other localities, that the sewage of this town is exceptionally weak as compared with that of other towns, the Local Board of Health being restrained by injunction from connecting the drainage of a large number of houses with the sewers. In order to secure efficient purification, therefore, it may be necessary to lay out as intermittent filters even double the area of land per 10,000 of population that is employed at Merthyr-Tydvil, when, at the time of our inspection, only from two to five acres per 10,000 people were being employed. The experience of these filter-beds at Merthyr has made plain what the experiments in our laboratory had previously established—that towns can cleanse their sewage upon a much smaller area, or, rather, within a much less quantity of land, than any experience hitherto of sewage irrigation had led them to expect."

In Table No. III. the results of downward intermittent filtration are very satisfactory.

Here, again, we find the same difference of opinion which we have already noticed in considering other branches of this subject.

Sir J. W. Bazalgette says:[1] "Then there is another process which is very much in favour at this moment, because it helps to get rid of what I may call the land difficulty; and that is, the intermittent downward filtration system which Mr Bailey Denton has started Merthyr-Tydvil, based upon the experiments of Dr Frankland, w showed, by experiments which he made, that the sewage from 3 people could be filtered through an acre of land drained two yards de so as to purify it entirely. Based upon that theory, Mr Bailey Den laid out a farm at Merthyr-Tydvil, and he drained it two yar deep, and poured the sewage for a short time of 1000 people p acre upon that land; and then, based upon that experiment, it proposed that all over the country where there is a difficulty ab obtaining sufficient land for sewage farms, to fall back upon intermittent downward filtration, and to put the sewage of 1500 or 2 people to an acre of land, regardless of the soil. That propositi rendered it necessary that I should go about two years ago Merthyr-Tydvil to see what was done, and there I found that ther was a gravelly soil 50 feet in depth, an admirable opportunity drainage, and circumstances more favourable than could be obtained almost in any other place, and that they did for about six month under those favourable conditions apply the sewage of 1000 people to the acre without causing any nuisance; but that the engineer who had charge of it—a very intelligent engineer of the name Harper—came to the conclusion, that even under those favourable conditions you would not apply the sewage of more than 5 people to an acre safely and permanently. The plan for th process which they adopt is to take three acres to begin with they divide it into three, and they irrigate one acre for one yea and leave the other two acres at rest. Next year they turn th sewage upon the second acre, leaving the acre which has bee under sewage for the former year two years to purify itself again. Now that calculation means, that before the year was out for some time, and for some time after the year was out, the land has been charged very heavily with sewage, and therefore cannot have been in a proper state for purifying sewage. Then they divide the acre which is in use into three parts also, and they pour the sewage for eight hours upon one part, eight hours on another, and for the remaining eight hours upon the remaining third; therefore, there are 1000 people to the acre, there is going on a portion of the land for a year the sewage of 3000 people; that is, 1000 people upon one-third of an acre, which is equal to 3000 per acre. The theory is, and it is a very good theory, that the sewage should be allowed to go through land well drained and well aërated, and, coming in contact with the air, it is oxydized and purified; but if it is allowed to be upon the land for any length of time, it gets clogged, and the sewage is not purified, and therefore they apply it intermittently, and they allow it time for the air to pass through it. It is a very useful plan, as are all other modes of dealing with sewage under certain conditions; but it is very apt to be taken up, as most of these theories are, and applied too extensively, which must only end in great disaster. The fact is, that for a city of

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[1] *Clyde Purification Commission*, p. 53.

00,000 inhabitants, it should be very carefully applied only nder very favourable conditions, and not carried to too great an xtent."

Upward filtration can only completely remove suspended matter, ut as the most polluting matters are in solution, this process may e dismissed with a very short notice. Indeed, it cannot be eriously entertained by any one who recognises the action of the ir in the destruction of organic matter. Upward filtration does ot allow of the re-aëration of the earth, or whatever is used as the iltering material; and therefore as soon as the original air is xhausted, the filter must of necessity cease to act except as a nechanical separater of suspended matter. Possibly Dr Frankland's xperiments show this process in a more favourable light than we would expect to meet with in actual practice. He found (see No. 5, Table II.) in his best result, that half of the organic carbon was removed, and six per cent. of the organic nitrogen.

In his worst, little more than one-half per cent. (*i.e.*, 0·6) of organic carbon and 12·4 of organic nitrogen was removed. On an average, 26·3 of organic carbon and 43·7 of organic nitrogen were removed by this process. No doubt, if the experiments had been continued for a longer period with the same filtering materials, the results would have been even less satisfactory, because, as the filtering material became loaded with organic matter, its purifying power would gradually be lost.

(*To be continued.*)

Report prepared by the Puerperal Fever Committee of the Berlin Obstetrical Society, and laid before the Prussian Minister of Public Health—Dr Falk. Translated from the *Zeitschrift für Geburtshülfe und Gynäkologie,* Vol. III. Part I., by Dr CHARLES E. UNDERHILL.

BERLIN, 4*th December* 1877.

WE undertake in this Report to direct the attention of your Excellency to the injury which is done to the national well-being and to family happiness by the ravages of the so-called malignant puerperal fever among recently delivered women, because we are convinced that it is not in the power of even the most perfect medical skill, and conscientious performance of duty on the part of the physician, unaided, to put a check upon it, but that for that purpose it is necessary to call in the aid of ordinances and laws.

Before we pass to the consideration of the regulations which seem suitable for the lessening of childbed fever, it will be our object to show by official, and, as far as may be, trustworthy statistics, that the destruction caused by this dreadful disease is, in point of fact, so extensive as to call for the most serious attenti on the part of the Government.

Direct data relating to the mortality from puerperal fever ha been published by the Statistical Bureau of the City of Berlin f the sixteen years from 1861 to 1876 inclusive.

From these figures, which are taken from the certificates o death, it appears that, in all, 2751 lying-in women died o puerperal fever in Berlin during these sixteen years. *A pri* it appears highly probable that this number falls considerabl short of the reality. The probability of this rests upon th simple consideration that, while it is exceedingly unlikely tha from an error in diagnosis, a case should be registered as d to puerperal fever without good reason, it is quite certain tha many deaths which ought really to have been returned as "Puerperal Fever" are concealed under the headings "Abdominal Inflammation," "Peritonitis," "Pneumonia," "Pyæmia," and such like.

That the numbers published by the City Statistical Bureau d not represent the full mortality from puerperal fever is further shown by the returns of the Royal Police Authority for the years 1869 to 1873 inclusive. Thus, there died of puerperal fever as returned from these two sources:—

	A. Statistical Bureau.	B. Royal Polic Authority.
In 1869, ...	99	145
„ 1870, ...	119	172
„ 1871, ...	261	257
„ 1872, ...	280	310
„ 1873, ...	231	251
In five years, . .	990	1135

That is to say, according to the Royal Police reports the deaths from this disease were, for the five years, 145 more, or at the rate of 29 per annum.

Now, in order to arrive at, at least, a minimum number representing the difference between the real mortality of puerperal fever and that published by the Statistical Bureau, we have, first of all, taken the trouble to verify for a fixed period the diagnosis of the death certificates from which the data of the Statistical Bureau are taken. For this purpose we proceeded as follows:—From the total number of death certificates we chose those, behind which cases of puerperal fever might be concealed, and wrote to the *physicians*[1] who had signed these certificates, asking for further particulars as to the nature of the disease. The result was that for the six months from October 1876 to March 1877 inclusive, to the 93 cases which were duly reported in the certificates as puerperal fever, there were 18 more to be added which were entered in he certificates under some other name. We have, in addition, y further inquiries among the physicians, heard of four more fatal ases of puerperal fever during the same period. Thus, we have iscovered that during this period of six months, instead of 93 cases nown to the Statistical Bureau, at least 115 certainly occurred.

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[1] The italics are in all cases in the original (Trans.)

We may fairly assume that these facts which we have proved or a fixed period of time also hold good for other periods. We re the more assured of this, because there can be no doubt that a till further number of cases of puerperal fever escaped our nquiries, so that the figure which we have arrived at in this way s only a minimum, which does not yet show the full measure of he mortality from puerperal fever, and which in all probability alls very considerably short of it.

Assuming, then, that the relation which our more accurate inquiries have shown to exist, between the actual mortality from puerperal fever and the figures contained in the public records, is the same for the above-mentioned sixteen years as in these six months, we have, instead of 2751 fatal cases, 3402, or at the average annual rate of 212·6.

Let us now consider how we can apply the results we have obtained to larger numbers.

There are no statistics about puerperal fever in the whole State of Prussia available, but from official sources, namely, the "Prussian Statistics," we obtain figures which show the mortality "in pregnancy and in childbed." We first inquire from the numbers for Berlin how many of those who died "in childbed" perished from puerperal fever. We have comparative numbers from the years 1861 to 1875 inclusive. (The returns for 1876 are not yet published.) There died (in Berlin):—

	From Childbed Fever.	In Pregnancy and Childbed.
1861,	147	131 (— 16)
1862,	157	165 (+ 8)
1863,	131	143 (+ 12)
1864,	176	157 (— 19)
1865,	171	153 (— 18)
1866,	135	161 (+ 26)
1867,	120	141 (+ 21)
1868,	185	188 (+ 3)
1869,	99	143 (+ 44)
1870,	119	152 (+ 33)
1871,	261	280 (+ 19)
1872,	280	326 (+ 46)
1873,	231	247 (+ 16)
1874,	202	211 (+ 9)
1875,	183	242 (+ 59)
In fifteen years,	2597	2840

Now, if we make a calculation, based upon our inquiries for the six months, as to what is the excess of deaths from puerperal fever over and above the numbers given in the public statistics, we arrive at the remarkable result, that (just as in the sixteen years 3402) so in the fifteen years 3211 lying-in women died of puerperal fever; that is to say, *more* than the State statistics allow to have died in pregnancy and in childbed *put together*.

From this we are driven to the conclusion, that in reality a considerably greater number of women died in pregnancy and in childbed than appears from the old statistics derived from the church registers. Further, we are driven to the conclusion, that of the mortality "in pregnancy and in childbed" the mortality from puerperal fever has by far the greater share, and that the latter is so important an element as to throw all other causes of death quite into the shade—a conclusion which is entirely supported, as far as Berlin is concerned, by a comparison of figures for the several years.

But an objection may be raised to our comparing the statistics of Berlin with those of the whole State of Prussia, namely, that in Berlin, with its dense population and its two great lying-in institutions, the cases of puerperal fever are much more frequent than in the country. Accordingly we inquire what relation does the mortality "in pregnancy and in childbed" in Berlin bear to that of the whole State of Prussia. In Berlin, during the years 1861–1875, out of 431,600 lying-in women, there died 2840 (equal to a mortality of 0·658 per cent., or 1 in every 151·97 cases); while in the State of Prussia, during the years 1859–1875, out of 14,735,799 lying-in women there died 116,615 (equal to a mortality of 0·792 per cent., or 1 in every 126·33 cases. *The mortality in pregnancy and in childbed is thus shown to be considerably less in Berlin than in the whole of Prussia.* Since, then, we have seen above from the figures for Berlin that the great majority of those who die in pregnancy and childbed die of puerperal fever, we can but conclude that puerperal fever carries off less women in Berlin than in the whole of Prussia. At any rate, although the objection be true, that on account of the more ready provision of skilled medical aid the number of fatal cases "in pregnancy and in childbed," from causes other than puerperal fever, is less frequent in Berlin than in the provinces, from these figures we may conclude that Berlin shows by no means a special frequency of puerperal fever, but that this disease occurs at least quite as frequently in the provinces.

But since, according to the public records of Berlin, the number of those actually registered as dying "in pregnancy and in childbed," bear, to those who were shown by our inquiries to have really died of puerperal fever, the proportion of 100 to 113·06, it follows that if, according to the church registers, in seventeen years there died in the whole of Prussia 116,615 women in preg-

ancy and in childbed (a rate of 6865 per annum), at least 133,841 omen must have died of puerperal fever, which gives an annual ate of 7873. Even this number is too low for the present rate, ecause the State of Prussia is now more extensive than it was ormerly; so that if we only take the period since 1867, there ave died in pregnancy and in childbed, during nine years, 0,666 women, or at the rate of 7851·7 per annum. This will ive, with our corrections, for the State of Prussia as it now exists, mortality from puerperal fever of 8872·4 women per annum.

From these large numbers it can now be clearly seen what an mportant factor puerperal fever is in the mortality of the country.

Again, the official records show the mortality in pregnancy and hildbed—which we have shown to fall considerably short of the eality—to be as follows:—Out of every 100,000 inhabitants of he whole of Prussia there died in childbed from 28 to 39 women annually in seventeen years; and of every 100,000 deaths during hese seventeen years, from 880 to 1280, or on an average 1091[1] women have died each year in childbed—in other words, out of every 100 deaths occurring in the State, *one* at least has occurred in childbed.

As a further proof of the great danger into which women of the ages from 20 to 45 are actually brought by puerperal fever, we cite the experience which the great Life Assurance Societies have had with women within these ages. The figures are derived from information supplied to us by Dr Wegscheider, examining physician to the Berlin Life Assurance Society. Whilst, according to the calculations on which the tariff is based, the general probability of death for men and women taken together is, for the ages from 26 to 30, 0·82 per cent.; from 31 to 35, 0·89 per cent.; from 36 to 40, 1·09 per cent.; and from 40 to 45, 1·30 per cent.; the *actual* mortality among *women* at these ages respectively was as follows:—

Berlin Society, 1·44 per cent.; 1·28 per cent.; 1·50 per cent.; 0·99 per cent.

Gotha Society, 1·66 per cent.; 1·79 per cent.; 1·92 per cent.; 0·92 per cent.

This difference is of such practical importance, that the Berlin Society has found itself compelled to require not merely a single extra premium for pregnant women, but to receive no woman from the beginning of the childbearing age up to forty years without an addition to the yearly premium on account of her sex.

The importance of the mortality among women from puerperal fever is most clearly brought out by comparing it with the mortality arising from the most terrible epidemic diseases, such as smallpox and cholera.

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[1] These numbers are misprinted in the original. I have corrected them from a reference to the tables given in a paper by Dr Boehr, which accompanies the report and contains in full the statistics upon which it is based (Trans.)

According to the tables which we have constructed, there di smallpox during the seventeen years from 1859 to 1875 inclu 211,069 persons—and of puerperal fever 133,841 women, accor to our reckoning. The excess of mortality from smallpo caused by the severe epidemics which broke out as a result of the with France, and which in two years carried off 124,948 perso If we leave out of account these two years, we find that in t remaining fifteen years 86,121 persons died of smallpox, a 99,070, or, with our corrections, 111,949 women died of childb fever. Thus, apart from the quite excessive smallpox epidemic 1871 and 1872, the death-rate from puerperal fever is considera greater than that from smallpox. And we can state in addition fact, which is likewise brought out by our tables, viz., *that t* carrying out of compulsory vaccination has reduced the mortali from smallpox to 9 per 100,000 living in the year 18 and to 3 per 100,000 living in the year 1875, whilst t mortality from puerperal fever reaches, year after year, to from to 39 per 100,000 living.

The deaths from cholera, in the seventeen cholera years wh occurred between 1831 and 1867, numbered, in the State Prussia, 343,726. To these falls to be added the latest epidem in the years 1873 and 1874, about which we cannot obta accurate data; so that in *forty-six* years, from 1831 to 1877, nineteen cholera years there have occurred about 360,000 *death* But in seventeen years there died in the State of Prussia, accordin to our reckoning, 133,841 women from childbed fever, so th the mortality from childbed fever is almost as great as that fro the dreaded cholera, and *may even be looked upon as greater,* we take into account the fact that 114,683 deaths from choler took place in the year 1866 alone, in consequence of the grea extent of the epidemic brought about by the war.

We claim to have proved by these bare numbers the immen importance of the mortality from puerperal fever. But the figur appear in even a more serious light if we consider that whi cholera and smallpox affect indiscriminately men and women, o and young, and especially the weakly of every age and of eithe sex, puerperal fever finds its victims *solely among young moth* The 133,841 fatal cases of puerperal fever in the seventeen yea came from among women who had just become mothers; in other words, there die at the present time in the State of *Prussia* annually 8872 women in childbed, and their death is no necessarily connected with the process of childbirth.

The full intensity of the ravages which take place among women of childbearing age as a result of death in childbed, or, as it should more properly be called, death from puerperal fever—for this is the cause of death in an overwhelming majority of the cases—can be best recognised and most thoroughly estimated by inquiring what is the relative mortality "in childbed" as comared with the *total number of deaths among women of the child-earing age;* and this last we know accurately from public records, ecause there is here no question of doubtful diagnosis.

We are in a position, most respectfully, to lay before your Excellency materials, derived from the last volume of the Prussian tatistics, for a decision and a comparison of the fatal cases "in hildbed," with the absolute total mortality among women of the ges of 15 to 20, 20–25, 25–30, 30–40, 40–50, in the whole ountry, in each registration district, and in every province, and his we have done in the accompanying table.[1]

Your Excellency will perceive from our arrangement of the 7213 deaths for the year 1875, under the respective registration districts, provinces, town and country population, and ages, and the similar arrangement of all deaths of women of childbearing age from any cause whatever, as also of the special cases of women dying "in childbed,"—a minimum number according to our previous observations:—1. That no registration district and no province of the country escapes from a high mortality "in childbed," that is to say, from puerperal fever. 2. That this public calamity bears in the provinces of the State the scarce credible proportion of from 10 to 15 per cent. to the total mortality among women of childbearing age from all causes.

In order to specify more precisely the varying share which the different ages of women have in this mortality, we extract from the general tables for town and country populations, arranged in relation to cause of death and age, for the year 1875, the following:—

1. Out of 5893 deaths between the ages of 15 and 20, 147, or 2·48 *per cent.* died in childbed.
2. Out of 7581 deaths between the ages of 20 and 25, 1066, or 14·06 *per cent.* died in childbed.
3. Out of 8741 deaths between the ages of 25 and 30, 1624, or 18·58 *per cent.* died in childbed.
4. Out of 18,353 deaths between the ages of 30 and 40, 3241, or 17·65 *per cent.* died in childbed.
5. Out of 16,544 deaths between the ages of 40 and 50, 1017, or 6·15 *per cent.* died in childbed.
6. Out of 2917 deaths of unknown age, 118, or 4·05 *per cent.* died in childbed.

Total.[2]—Out of 60,029 deaths within the childbearing ages, 7213, or 12·09 *per cent.* died in childbed.

We call attention to the fact that the year 1875, whose statistics, abstracted from the recently published vol. 43, disclose these terrible and uncontrovertible details, with its 7213 "deaths in childbed," is by no means one of excessive mortality from this source, but, on the contrary, presents the least noticeable and smallest numbers, both absolutely and relatively, to the number of lying-in women, and to the total mortality among men, women, and children in the State, of any of the 17 years; so that this distinct conclusion is justified, that in the earlier years (as, for example, in 1872, with its 9872 deaths, at least, in childbed, and in 1873, with its 9241), the percentage of deaths in childbed among women of childbearing age has been in reality far higher than 10 to 15 per cent. of all deaths among women within these ages in every province of the State of Prussia.

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[1] This table is published in full in Boehr's work above mentioned.

[2] It is to be noticed that this total includes the years at both extremes of the childbearing age. If we take only the deaths for the fifteen years, 25–40, the most prolific and consequently the most exposed to puerperal fever, we arrive at this terrible result: ut of 27,094 deaths from all causes, no less than 4865, or 18·11 *per cent. died in childbed;* and this, too, is the lowest possible figure, and in a year, as shown below, in which the puerperal fever mortality was relatively very small (Trans.)

We shall not attempt to portray from a humanitarian point of view the anguish which falls upon the numerous families where the wife and mother, who but now was radiant with the full bloom of health, has been carried off, just as the family has been increased by a new member, still utterly helpless and dependent upon a mother's care; nor shall we point out what injury is done to the national life of the State by the yearly death of thousands of mothers, and the ruin of thousands of families caused thereby. We may fitly compare the manner in which puerperal fever finds its victims in a definite class of persons, with the losses which are entailed by a great war. Just as in the latter case, the losses fall exclusively upon the young and vigorous male population, *so in the former is the most valuable part of our female youth carried off by puerperal fever;* nay, more, the loss which the family and the State suffer in consequence of puerperal fever is more acutely felt than that which in general accompanies war, because the latter concerns usually the unmarried and only just full-grown young men. The loss of an entire battalion of Landwehr is the only one which can be fittingly compared, in the severity of its results and the intensity of distress which it causes, with the ruin which puerperal fever brings with it.

The comparison between puerperal fever and the losses caused by a devastating war is so striking, that we may be allowed to develop it still further. Just as we reckon among the losses in war not only the killed but also the wounded, so does puerperal fever carry in its train a very numerous host of women, who have escaped with life, but only to become life-long invalids. How great the number is of women who owe their constant ill health and subsequent sterility to puerperal fever, we have no means of accurately determining; but every physician knows that by far the greater part of the diseases of women date from a childbed, and that a very large number of them are caused by infectious processes; and every physician knows how very frequently it happens that women, who have conceived soon after marriage, never become pregnant again, because they have suffered from childbed fever.

We believe that the figures and calculations we have brought orward are amply sufficient to show that puerperal fever must be ooked upon as, in the fullest sense of the words, a great national alamity, and we anxiously and expressly put the question, "Can t be avoided, and how?"

Before we proceed to answer this question, allow us to give a road outline of what we mean by puerperal fever, and how it is rought about.

Under the names "puerperal fever," "malignant childbed fever," re included a group of diseases occurring in childbed, which vary ery greatly in their manifestations, but have this in common, hat they are called into being by the absorption from the organs f generation of a material which gives rise to destructive inflammation and fever. There are, indeed, a number of substances, mainly composed of organic materials in a state of putrid decomposition, which, when brought into contact with an open wound, set up inflammation in it, which extends to the neighbouring tissues; a further absorption by the lymphatics and bloodvessels leads to more extensive inflammation among neighbouring and remote organs; and when a large quantity is rapidly absorbed into the blood, a quickly fatal poisoning of the whole organism occurs. To surgeons the deadly effect of these materials upon wounds is only too well known, and the greatest advance, probably, which surgery has ever made consists in the so-called antiseptic method of treating wounds—that is, in the scrupulously exact removal of such materials from fresh wounds.

Puerperal fever is indeed nothing else than the infecting of fresh wounds, such as are found in every newly-delivered woman, with these destructive septic materials. Almost every woman after labour has small wounds on the external genital organs, which are caused by the passage of the child through this narrow opening, and in every newly-delivered woman the inner surface of the uterus, from which the protecting membrane has been cast off with the ovum, presents a large wound surface. Thus, every newly-delivered woman is liable to suffer from the dreaded infective wound diseases,—which in persons wounded under other circumstances are called pyæmia, septicæmia, wound fever, blood-poisoning, purulent infection, etc.,—*so soon as suitable septic materials are brought into contact with the genital organs.*

Now, materials of this sort gain admission in two ways: first, and this happens more especially in very difficult and long labours, under the influence of the particles that cause putrefaction which are ever present in the air and ever ready to press in, decomposition occurs in the mother's own secretions and excretions, and thus takes its rise in the maternal organism itself; or, secondly, these materials are introduced into the female genital canal *from outside.* This latter is brought about almost exclusively by the finger or instruments of those who examine the lying-in woman—that is to say, of the midwife or the physician.

If the instruments or finger of these persons have not been cleaned with the greatest care, and disinfected most conscientiously after they have been in contact with any infective matters, the result is that these matters are brought into contact with the fresh wounds of the woman during labour or subsequently, and thereby infect her with a fatal disease. A specially frequent channel of infection is from a diseased lying-in woman to another, because midwives quite commonly go from a diseased lying-in woman, whom they are nursing, to attend upon a new confinement without sufficiently purifying themselves; and it cannot be doubted that, in the majority of cases, the midwives are the carriers of this infection, because to their exclusive care the great majority of labours is intrusted, and they naturally come into more intimate relations with the lying-in women than the physicians, who, in very many cases, are only called in after the onset of threatening symptoms.

From the foregoing exposition it will be seen that we know the cause of puerperal fever, and the manner in which it is brought about, more accurately than in almost any other disease, and, on the strength of this knowledge, have to ask ourselves the question, By what regulations can the occurrence and spread of puerperal fever be prevented, or at least lessened in amount?

These regulations naturally divide themselves into those which aim at preventing the occurrence of individual sporadic cases of puerperal fever, and those whose object is to avoid the transmission of the disease from infected lying-in women to healthy ones.

As regards the first object, it is obviously of great importance to avoid the putrid decomposition of the discharges which come from the woman during labour. This is, of course, the aim of a rational management of a case of labour, which would, if possible, bring the labour to a conclusion before any stinking excretions come from the genital parts; we work in the same direction by keeping away anything which can excite putrefaction. The midwife should, accordingly, remember that frequent and careless examinations hasten the decomposition of the secretions, and should be instructed to use *disinfectant injections* in all cases of prolonged labour, so that the products of decomposition may be formed in the female genital passages as late, and in as small quantity, as possible. Of still greater moment is it that the medical persons (*Medicinal-personen*) to whom is entrusted the care and treatment of the lying-in woman, should recognise to its fullest extent the danger which threatens women, where putrid substances are brought into contact with the sexual parts either by the finger or by instruments. Among physicians this danger has long been known, and is universally recognised; but midwives cannot be too earnestly and strongly warned of it. That the rising generation of midwives may be properly instructed in this matter, will require even more careful attention in the new editions of the hand-books midwives, and in oral instruction, than it has hitherto met th ; but it is quite essential that those already in practice, that those who were passed midwives prior to 1866, the year in ich the present *Kangow Hand-book for Midwives* was introduced, ould receive fundamental and exact instruction as to wherein the nger lies, and how it is to be avoided. We do not consider it as r object to work out such a system of instruction, but we feel it r duty to lay great stress upon this point, because the great ajority of our practising midwives are without anything like a fficient appreciation of the danger.

Indeed, since it may be long ere all midwives are thoroughly structed on this subject, the question arises, Whether it would t be the wiser plan to appeal directly to the public in this atter, and to enjoin upon husbands not to allow their wives to examined by any hand which has not previously been oroughly disinfected ?

When we reach this point, when it is the universal custom, *in ery single case, and under all circumstances, for the physician and idwife to disinfect their hands before they introduce them into the genil organs,* then, without any doubt, the annual mortality in childbed ill become very much less, and thousands of women, who now ie of infection brought about by thoughtlessness or ignorance, ill be saved.

It remains to speak of special rules for those cases in which uerperal fever has already broken out, because the danger of ransmission of the disease then becomes more considerable, and experience teaches us that, where definite epidemics of puerperal fever occur, *they cling for the most part to the practice of a single midwife.* A large number of instances are on record in which a midwife has carried the infecting material from one diseased lying-in woman to others, with the result that a number of newly-delivered women have sickened, and many of them have died.

In order to cut short these definite epidemics when they arise, and to prevent them from breaking out, it appears absolutely necessary *to lay upon all medical persons* (Medicinal-personen) *by law the duty of reporting such cases to the Sanitary Boards.* The simplest way of effecting this is to include puerperal fever among the contagious diseases, of which it is necessary to send in a report. Undoubtedly special difficulties present themselves in regard to diagnosis. The question whether a disease during lying-in is to be looked upon as an infectious childbed fever or not, may be a very difficult one even for the physician, and is entirely beyond the judgment of a midwife. Accordingly, we hold it to be the bounden duty of midwife and physician to make a report to the sanitary authorities, *in every case of severe feverish disease occurring in childbed, unless it be clearly established that it has no connexion with the puerperal process.*

But since even here differences of opinion may arise, there is one thing, at all events, about which there can be no doubt, nam death; we therefore deem it necessary to add, *that all mid are in duty bound to give notice of every fatal case during chil which occurs in their practice.* The sanitary authorities will probably in this way get sufficiently early notice of the existence puerperal fever epidemics.

But if they are to be in the position effectually and certainly cut short commencing epidemics, *they must have the power to suspend the midwife from the practice of her calling for a fixed peri* since this is the only sure means of preventing the extension of the disease through the same midwife.

We are thoroughly convinced, especially when we consider how wonderfully the mortality from smallpox has decreased since the carrying out of compulsory vaccination, that these rules will have a decided influence in lessening the mortality from puerperal fever; and, although we are far from believing that puerperal fever can in this way be rooted out, and though we do not for a moment doubt that, even under the strictest laws and with the most scrupulous care on the part of medical persons, sporadic cases of puerperal fever will always occur, yet we must express a confident hope that, by the carrying out of the regulations sketched above the mortality from puerperal fever will be very materially diminished, and that in this way every year several thousands of young mothers, who now die, may be saved to their families and to the State.

With this hope we lay our suggestions before your Excellency with the prayer that you will examine them, and eventually will undertake the necessary steps to carry them out.

Signed, in the name of the Society for Obstetrics and Gynæcology in Berlin, by the Committee for the drawing up of Regulations to prevent the spread of Puerperal Fever.

Dr C. SCHRÖDER, Professor of Midwifery, Director of the Royal Lying-in Institution.
Dr MAX BOEHR, Medical Officer of Health.
Dr FASBENDER, Director of the Charité Hospital, Lecturer on Midwifery,
Dr A. MARTIN, Lecturer on Midwifery.
Dr LÖHLEIN, Lecturer on Midwifery.

Part Second.

REVIEWS.

n *the Therapeutic Forces: An Effort to consider the Action of Medicines in the Light of the Modern Doctrine of the Conservation of Force.* By THOMAS J. MAYO, M.D., Member of the Luzerne County Medical Society, Member of the Pennsylvania Medical Society, etc. Philadelphia: Lindsay & Blackiston, 1878. Pp. 143.

HERE is a great amount of thought and ingenuity expended in this ook, which, as the author modestly informs us, was originally tended for a journal article, and, had not its size precluded its ublication as such, would not have appeared in its present form. t contains much that is important and valuable; but we are doubt- ul if the doctrine of the conservation of force, which dominates echanical science so universally, can be applied so conclusively o the phenomena of physiology, pathology, and therapeutics. Dr Iayo has got hold of the idea, or rather it has got hold of him; nd he treats his subject with enthusiasm, undeterred by difficulties, y apparent contradictions, by the risk of being regarded as a heorist. We honour him for his faith, and must frankly confess hat it is probably founded on surer grounds than we are at present able to discover.

The introductory chapter is interesting, and worthy of careful perusal. So far we can go along with him. It is in some of the later portions of the course that we lose our breath, and feel that we are accompanying one who rides boldly across country, regardless of hedges, ditches, and streams. We admit, however, that he sustains no absolute falls, that he never takes liberties with, or casts down, any of the firm facts which observation and experience have established, although his theory gets over them somehow or other with wonderful agility. In short, the exercise of accompanying Dr Mayo is a bracing and healthful recreation to the faculties, with no dangerous consequences. The following passage gives a good specimen of the author's activity of mind and faculty of reasoning from analogy:—

"It is now a well-established fact, which was noted by Priestley in the last century, that plants under the influence of sunlight give out oxygen; that plants, through the aid of the sunbeam, have the power to separate oxygen from carbonic acid and water, and weave the carbon and hydrogen into vegetable fibre. The process of deoxidation implies that the atoms of carbon and of hydrogen are to be separated from oxygen, for which they have a strong and intense affinity, and be transferred to the vegetable organism, for which they have a weaker affinity; and to effect this change requires the expenditure of some kind of force, which is ordinarily supplied by the sunbeam. But in certain localities, and under certain circumstances, vegetation flourishes in total darkness; as, for example, it is a very common thing to find old boards and timber in coal-mines literally covered with fungi. Now, in the growth of these fungi, the same process of deoxidation, the same process of separating the carbon and hydrogen from oxygen, is going on, for these plants are also largely composed of those elements which are common to other vegetable structures, but wholly without the stimulating influence of the sunbeam.

"Here, apparently, is a reversal of the usual order of things, for these plants, by being deprived of the rays of light, are hid from that power which infuses light into vegetable matter on the surface of the globe; yet this seeming anomalous phenomenon of nature will disappear if we can account for the deoxidation which takes place here by some other force than that of the sunbeam. And we may, with good cause, suspect that, if any other force were brought to bear on these oxy-compounds with the same degree of intensity, it would accomplish a similar result.

"Now, it is a most remarkable fact that all these fungi are exceedingly rich in nitrogen, and it is very likely that their growth and development in absolute darkness is due to the presence of this element, for we well know that all substances which are noted for the suddenness with which they liberate their force and act, contain a large proportion of this element. Take, for example, nitroglycerine, dynamite, hydrocyanic acid, yeast, animal ferments, etc., all possess nitrogen, which, undoubtedly, empowers them with such great activity. If a chemical action is once set up, the amount of disturbance which is thus generated will be equal to the intensity of the primary action, and, if the conditions are at all favourable, it will be transmitted very readily to the surrounding particles. Now, if a portion of the nitrogenous compound which enters into the tissue of the fungi undergoes any sudden chemical change, like that which is characteristic of other nitrogenous compounds, gives out its force, thereby decomposing the carbonic acid and water which are constantly present in coal-mines, it may in this way *liberate the elements which are necessary for the construction of the plant.*" We have printed the last clause in italics to emphasize it. Is this not reasoning in a circle? The author would have been more logical if he had said—liberate the elements which are necessary for exploding the mine. This, however, is only a slip. The book cannot be read without interest and valuable suggestions for future inquiry.

iosphates in Nutrition, and the Mineral Theory of Consumption and Allied Diseases. By M. F. ANDERSON, L.R.C.P. Edin., and M.R.C.S. Eng. London: Baillière, Tindall, and Cox, Strand: 1878. Pp. 178 and Appendix.

HIS is a book very much to our mind. It indicates a great deal ' careful investigation and mature thought, and is written in a ear, accurate style, with much precision of language. The ithor, at the same time, knows how to illustrate his meaning by i occasional reference to subjects less abstruse than those he as in hand, without allowing a mere analogy to usurp the place f an established conclusion. The reader can receive his stateients and deductions as deserving of serious consideration, ecause they betoken a reasonable, cautious, and truth-loving turn f mind, with no undue anxiety for personal credit or self-assertion. Ve make these preliminary remarks, because we are anxious that he book should get a patient and appreciative perusal by those vho occupy chairs of instruction, believing, as we do, that it contains nuch that is valuable, and likely, if we do not greatly mistake, o leave a very decided mark on both Physiology and Therapeutics.

We cannot make good this opinion in our limited space, but must refer our readers to the book itself.

The idea which he mainly elaborates is this: that the *inorganic* materials in the soft tissues, and their relative proportions, exert a very important influence in nutrition; and that their absence or presence in insufficient quantities, either from diminished supply or imperfect assimilation, is the origin of a class of diseases (organic) which have hitherto received no adequate explanation as to their cause. He believes that the only form of phosphorus met with in food and in the animal tissues is phosphoric acid,—although some chemists represent the Protein compounds as containing phosphorus either in an elementary state or in some other combination than phosphoric acid. All the phosphates in the tissues are tribasic; nervous tissues containing in addition phosphoric acid as a hydrate or in combination with organic matter. Those tribasic phosphates possess the peculiarity, that the combination between the base and the acid need not be confined to one particular base; that is to say, the three equivalents of base may be built up of two, three, or more different bases, but always containing three equivalents of basic matter to one of acid. Take tricalcic phosphate as typical of this class; we may substitute for two equivalents of lime, one of magnesia and one of soda. There are here three equivalents of base to one of acid, just as in the tri-calcic compound. Each of these separate bases may be again divided and represented by an equivalent portion of some other base. These tribasic salts, Mr Anderson tells us, are insoluble in alkaline solutions, sparingly soluble in neutral; and this deserves being noted. They are of great importance in the formation of certain tissues, and their existence can be made out clearly in all tissues and organs which contain capillaries. He infers that they are components of arterial and capillary membrane, more especially as the inner membrane of arteries can be shown to contain them. He gives an interesting table showing the quantities in which phosphoric acid has been yielded by vascular tissues and organs, such as the skin, liver, kidney, lung, brain, etc.; while tendon, which is sparingly vascular and contains much less water than the other textures, exhibits a mere trace of phosphoric acid. This seems a strong confirmation of his theory, that the seat of phosphates in the tissues is in the capillaries. Why not bring it to the test of the microscope? Because that instrument takes cognizance of the minutest details of structure, but cannot as yet reach so far as chemical composition.

The capillaries, including arterioles, capillaries proper, and venous radicles, have to do with the building up of tissues; and it is essential to keep in view, that the inorganic constituents of food, the phosphates among the rest, are as essential for perfect nutrition as the flesh-formers and heat-producers,—the Protein compounds and the hydro-carbons. This must be obvious to every one who duly considers the subject. Mr Anderson treats this aspect of it with great care both as regards the *ingesta* and the egesta, and arrives at the conclusion, that much light is thrown by a deficient supply of phosphoric acid upon some very important diseases—scurvy, rickets, scrofula, tubercle, and cancer.

Scurvy.—We have already seen, that what may be called tissue phosphate takes an important part in capillary formation, and a consideration of the conditions which produce scurvy, the symptoms of the disease, and the treatment, illustrate the theory of capillary construction advocated. The late Dr Parkes had almost come to the same conclusion, for he says: "It seems clear that it is to the absence of some of the constituents of the fourth dietetic group, the salts, that we must look for the cause." The conditions favouring an outburst of scurvy are, want of wholesome fresh meat, of fruit, and succulent vegetables, accompanied generally with the use of salt meat. When meat is salted it loses a large quantity of its phosphates as well as a portion of its albuminates; and the phosphates abstracted are of necessity the most soluble, the most easily assimilated, and, in consequence, the best tissue-formers. Two specimens of fresh meat were found to contain respectively, ·256 and ·320 per cent. of phosphoric acid; while a sample of salt-beef from the stores of H.M.S. *Hector*, while in commission, showed only ·147 per cent. of phosphoric acid. The salt meat, thus examined, had not been previously soaked; but before being used in the Navy, it is soaked for some time in water to remove the brine, the effect of which will be, without doubt, to remove a still larger quantity of the phosphates, so that, when ready for consumption, it can contain but little phosphoric acid or phosphates. *Pemmican* ought to be great use, containing, as Dr Frankland shows, five or six times quantity of phosphatic salts that salt meat contains; but in er to that, the phosphates must be soluble, or be rendered so by use of citric acid. How does lime-juice act as an antirbutic? In virtue of the citric acid which it contains in the portion of 5 to 7 per cent. The other ingredients, potash and osphoric acid, in lime-juice, can have no appreciable effect; they in such infinitesimal quantities—·22 and ·30 per cent. The other icles of diet on shipboard contain both in far larger quantities; biscuit ten times as much potash, and phosphoric acid quite fficient for dietary purposes, if it were in solution, or capable of ing rendered so by a proper solvent. "The antiscorbutic action lemon-juice is thus reduced to its citric acid, and the efficacy of is depends upon the conversion of insoluble phosphates into luble for the formation of tissue phosphate."

Mr Anderson gives an interesting account of the chemical actions citric acid on the tribasic phosphates, as contrasted with those of e mineral acids, and sums up thus: "These facts, therefore, as gards the action of citric acid, together with the doctrine of pillary nutrition, tend to show that the efficacy of lime-juice as antiscorbutic depends mainly on the presence of citric acid, and referable to the solvent power of this acid on phosphates."

How is this reconcilable with the view entertained by Ganod nd others, that the deficiency of potash in scurvy is the important ircumstance? In this way, potash being the base which, of all thers, exists in large quantity in the inorganic portions of food, if be deficient, we may take for granted that the other ingredients, hosphoric acid among the rest, for the formation of tissue phosphate re also wanting; but in their absence in any easily assimilated orm, to give potash alone as an antiscorbutic is useless.

Again, if the blood, by the agency of acids, particularly the nineral acids, be rendered abnormally acid, tissue phosphate is not ormed. The bases which should go to the formation of this salt re combined with the stronger mineral acids, as chlorides, sulhates, etc., and cannot be assimilated in this soluble condition. The ame results occur as if there was an absence of material for tissue-hosphate formation. The symptoms of innutrition are identical. t matters not whether it be from absence of proper material for issue-formation, or from non-assimilation, whatever the cause of this last may be.

Had space permitted, we might have shown the application of the author's views to the various wasting diseases already enumerated; but we must confine our remarks to one.

Mr Anderson holds, that, as regards *consumption*, we must look in the capillaries for the first radical changes which produce all the varieties of that disease, and that the defect consists essentially in defective mineral nutrition. He recognises in advanced cases another agency which seems to exert considerable influence in preventing recovery: *septic influence.* Disintegration of tis brings the effete products of tissue destruction within reach of t absorbents or of the blood, and so has a tendency to vitiate t blood. No one doubts this in cases of advanced cancer; is otherwise in phthisis? The general emaciation shows that t whole system is affected by the disease; the nutrition of the w body is interfered with. Such cases may be confounded with cas of starvation Is there anything that may decide betwixt co flicting medical opinions, as in the recent Penge case? Here is a interesting and important answer: "In starvation, the miner constituents of tissue-phosphate would not be materially lessen —from wasting of the tissues caused by the combustion of th organic matter, there would be an apparent increase in the percentage proportion of mineral matter; on the other hand, in tubercu disease there would be a material decrease in the mineral matter a compared with the general wasting. In starvation, the soft tissue are quickly burnt up to supply heat, before the capillaries ha time to suffer any very material change in their mineral composition; in tuberculosis, the capillaries are the first to suffer."

In consumption and other wasting diseases, the capillaries a underfed, and cease to do their work. This may arise either fro deficient supply or from non-assimilation of mineral matter. It is the starting-point of the disease, and life ebbs out slowly. I starvation, from want of food generally, death ensues whenever there is an insufficiency of heat-producers in the blood or the tissue to keep up the normal temperature. Under such circumstances the remedy is at hand, if it be wisely and cautiously administered. But in organic disease, such as phthisis, the treatment adopted may slowly but surely do harm. A dietary deficient in the o necessary ingredient may be chosen, if we are guided merely chiefly by the attenuated state of the patient. Cream, cod-liver o and other food rich in the heat-producing element, have been ofte very useful in the treatment of consumption. Their use is quite explicable on the mineral theory advocated by Mr Anderson. Capillary weakness, from insufficient renewal of its mineral components, is the first cause of the disease. These weakened capillaries fail to do their work efficiently and thoroughly; an insufficient quantity of food is, by the process of digestion, rendered available for tissue nourishment and repair, and for the production of heat. The result is, that when all the fat in store has been consumed, muscle begins to waste in order to maintain vital temperature; or, to use the author's graphic mode of stating the case, "the stock in the coal-cellar runs low, and the house is pulled to pieces to furnish fuel for the ever-burning human furnace." Cod-liver oil, being by many persons easily assimilated, supplies fuel at the right time, and so far lightens the work of the underfed capillaries, so that what remains of their force may be turned to other purposes of nutrition. But cod-liver oil does not contain the elementary principle which the chemistry of consumption shows to be deficient.

The phosphorized oils, although containing phosphoric acid, are metimes useful, but can do little as tissue-formers, for, without e base, tissue-phosphate cannot be supplied.

The hypophosphites have been useful in many cases; but, as ypophosphorous acid has no place in tissue formation, it can only e made use of in the system when converted into phosphoric acid. The base with which it is combined, generally lime or soda, can hen help to form tissue-phosphates, the requisite compound. Keeping these principles in view, we can see how phosphoric acid, given along with the hypophosphite of soda, may add to its efficacy, and also how Dr Charteris of Glasgow finds advantage from giving the hypophosphite of lime and soda alternately. Would it not be more reasonable, as Mr Anderson has done, to use a tribasic phosphate containing all the bases which analysis has discovered in the coats of the aorta and all the organs examined? He proposes, by supplying all the mineral ingredients of nutrition, to leave nothing to chance, so that if there be a fair amount of assimilation, all the mineral elements for tissue-fabrication or renewal may be present.

We hope that this necessarily imperfect account of the book under review will awaken an interest in the subject, and induce our readers to study it for themselves. Many suggestive thoughts are thrown out, which may be prosecuted with good results.

Forms for the Taking of Aural Cases, with Drawings and Outlines of the Membrana Tympani, of Fauces and of Posterior Nares, and with a short Explanation of the significance of various Aural Symptoms. Similar *Forms for the Taking of Throat Cases, with Outlines of Fauces, of Posterior Nares and of Larynx as seen in the Mirror, and with a Tabular Statement of the Differential Signs of various Laryngeal Lesions.* By LENNOX BROWNE, F.R.C.S., Edin., Author of *The Throat and its Diseases*, Senior Surgeon to the Central London Throat and Ear Hospital, etc., etc. London: Baillière, Tindal, & Co: 1878.

THE above titles sufficiently explain the object of these *Forms*. They are the same as are in use at the Central London Throat and Ear Hospital, of which institution their author is Senior Surgeon.

They will supply a want, and are likely to be appreciated by all grades of our profession, and by those especially who are interested, in the smallest degree, in ear and throat diseases. Further, the practical remarks that accompany these forms, as well as the suggestiveness of the detailed method of examining cases of ear and throat disease here introduced to the notice of the profession generally, must, we think, prove valuable to those of our junior brethren who are not yet experienced in examining such cases, and who therefore lack a knowledge of the questions that it is necessary to ask of a patient, an order to expiscate all that pertains to the case, whether it be one of ear or of throat disease. Len Browne, we consider, has done good service to the professi making these useful *Forms* accessible to them.

It may be added, that a volume containing 25 sheets e of Ear and Throat forms, together with the practical rema appropriate to both classes of diseases, may be had from t publishers, Messrs Baillière, Tindall, & Co., London, for the s of three shillings and sixpence.

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A Practical Treatise on Aural Surgery. By H. MACNAUGHT JONES, M.D., M.Ch. and F.R.C.S.I. and Edin., Surgeon to t Cork Ophthalmic and Aural Hospital, with Special Thr Department; Surgeon County and City of Cork Hospital f the Diseases of Women and Children; Assistant-Surgeon C South Infirmary and County Hospital; and late President the South of Ireland Branch of the British Medical Associati etc., etc. London: Churchill: 1878. Pp. 172. 5s.

An Atlas of the Diseases of the Membrana Tympani. By the sa Author. 1878: London: Churchill. 59 figures in 8 plat with descriptive letterpress, 21s.

THE perusal of this *Practical Treatise on Aural Surgery,* by D Macnaughton Jones, has afforded us much satisfaction.

Although we confess that its title seems to us to be a little t ambitious, we think, nevertheless, that it compares favourab with already-existing manuals of aural surgery, and we also thin that it will take a permanent place in the literature of th important subject. Our reasons for speaking as we now do are a follows:—The book has been written expressly to interest and t instruct general practitioners in the important subject compas by its title, viz., *Aural Surgery,* by one who is himself a go "all round" general practitioner. Indeed, Dr Jones, whose professional energy and capacity for work is hardly equalled, an certainly not surpassed, by any of his Irish *confrères,* is well known by the profession on both sides of the Channel as being not onl a good ophthalmic surgeon, but an excellent aurist as well, and equally capable of guiding a fever or of conducting a difficu midwifery case to a successful termination; in fact, he is in Ireland what Jonathan Hutchinson is in England—the *facile princ* of general surgeons.

When all that the book contains is of general excellence, it is difficult to point out any one part as more worthy of praise in a notice such as this is, without praising everything contained in it; but we cannot help calling attention here to the clear and well-written description of the use of the "tuning-fork" in the diagnosis of the diseases of the ear (p. 44), and to the very exhaustive

chap. xii.) account of "Othœmatoma, or Sanguineous Tumour of he Auricle," or the so-called "insane-ear," both of which illustrate very well the fitness of the author to write such a book and the extent of his reading and clinical observation.

We were disappointed, however, on examining the *Treatise*, as well as the *Atlas*, to find that nothing definite is said about the ætiology and diagnostic value of the cretaceous deposits that are so frequently seen on and in the membrana tympani. Perhaps this has not been an overlook on the part of the author, for he may not consider this information of value, in a practical sense, to those for whom he has designed this volume. However, in another edition of his book, the author may see fit to give to his readers the results of his experience on this point.

On the whole, the volume is a meritorious production, and, although it is not faultless, it reflects great credit upon its able author. We wish it every success, and we therefore recommend it to our professional brethren who are engaged in general practice as a book to be consulted by them with confidence.

It is copiously and well illustrated.

The Atlas of the Diseases of the Membrana Tympani, by the same author, is a beautifully executed work of 8 plates, having 59 figures in chromo-lithography of the membrana tympani, in health and in disease, as well as several truthfully typical representations of the "insane ear."

The excellence of the execution of these figures commends itself to our admiration. They are natural also (*i.e.* truthful) and delicately finished; so delicate, indeed, are they, that it became necessary for us to examine the figures in our "proof" copy of the *Atlas* to discover if they were really chromo-lithographs, and not highly-finished water-colour drawings. We therefore have no hesitation in recommending this valuable contribution to aural pathology to the notice of those who may become, or who are already, possessors of the *Treatise* by the author of this *Atlas*. Both are necessary to each other—the *Atlas* illustrates the text of the *Treatise*, and this latter describes the plates of the former, while both are marvels of cheapness.

Contributions to the Physiology and Pathology of the Breast and its Lymphatic Glands. By CHARLES CREIGHTON, M.B., Demonstrator of Anatomy in the University of Cambridge. With Illustrations. London: Macmillan & Co.: 1878.

THIS book is the result of the labours of a patient and conscientious worker brought together in their present form after careful consideration and conversation concerning the aims and subjects of investigation, as well as a criticism of the results obtained by such men as Mr Simon.

The subject is treated under the two heads of physiology and pathology; under the first we have five chapters, and three chap- under the latter. Chapter first deals with "the periodical inv- tion of the breast," first histologically and then physiological Our author uses the term "involution" in the same sense Langer, *i.e.*, the upfolding process; the addition "periodical" distinguishes it from the final atrophy or disappearance of the secreting structure that occurs in women at the climacteric years, a part of the general "sexual involution." "If the word involution be used for the upfolding process, the correlative term for the unfolding process cannot well be anything else but 'evolution.'"

The first two chapters contain an account of those two processes of the breast. The third chapter treats of the lymphatic glands near the breast, as appendages of the secreting gland. While the chapter on lymphatic glands is an integral part of the investigation on the mammary secretion, it is at the same time an independent contribution to the knowledge of the structure and function of the lymphatic glands, and it will be found to contain a comparatively new exposition of their function.

The fourth and fifth chapters contain a new account of the development of the breast, and some considerations on the development of its function. Mr Creighton departs entirely from the views at present held as to its formation from the epiblast, based upon the researches of Kölliker, Remak, and others. "The development of the function of an organ is naturally bound up with the development of its structure; it is the same dualism of structure and function that has been referred to. But the function in its development is as capable of independent treatment as the function in its maturity,"—so says our author, and sums up in the following conclusion:—"The embryonic cells, in order to become the secreting cells of the mammary acini, go through a cycle of changes; and the changes that they undergo are precisely those that the cells of the mature organ undergo in producing their periodical secretion." The function of the breast is therefore said to be a sustained repetition of its development. The first "period" of the breast is its development. This is a chapter to which special attention ought to be given, for, if the observations and conclusions put forward in it have any weight, the whole foundation of our ideas on the genesis of all true glands in the body will need reconstruction. If secreting epithelial cells are, as the author believes, formed from the elements of the mesoblast in one case, it is fair to infer that they may be in all; and so the theories of Waldeyer, Remak, and other eminent histologists, bearing on the distinctness of the epithelial from the connective tissue structures fall to the ground. This is a question of much wider significance than might at first sight appear. The description on pages 98 and 99 of the mode of development of an acinus, is extremely startling to those who have been hitherto led to believe that the embryonic tissue, from which fat cells are produced, are incapable of forming, under any circumstances, anything but fat cells or connective tissue.

Chapters VI. and VII. contain the application to disease of the ysiological principles enunciated in Chapters I. and II. They eat of morbid physiological processes of the breast, and show y an examination of a series of cases that the common and alignant tumours of the breast, as well as some of the rarer rms (Chapter VII.), owe their origin to functional irregularities f the gland; the varieties of cancers of the breast, hard and oft and the like, being necessarily kept in view, whilst the umours are discussed, not with reference to their subdivision n points of structure, but with a view to making out the articular departure from the normal process of the gland, to hich their existence in each case is due. In other words, it is he excitation (*Reiz*) that is chiefly considered. In a former paper On the Histogenesis of Secondary Tumours in the Liver," in the Report of the Medical Officer of the Privy Council for 1874, p. 95, 96, our author defended the use of the word "cancer" as a eneral name for all malignant tumours. It is here used in that ense, "and it can be so applied with strict propriety to a class of umours described in the sequel, which, from the shape of their ells, might be called sarcomata, but which are none the less the product of functional disturbance of the secreting parenchyma.

The author's theory as to a tumour-formation in the breast may be briefly indicated as follows:—In healthy evolution, formative and functional activity go hand in hand throughout the whole organ, the waste products formed by endogenous growth passing out partly into the lymphatics, and partly accumulating in the ever-expanding acini and ducts, until finally poured out at the climax of the process—lactation. If, on the other hand, during the period of rest of the organ after complete involution, an abnormal stimulus be imparted to a portion of the gland, the cells of the latter are incited to proliferation, and waste products are produced in abundance by endogenous growth. It is a repetition of the physiological act of evolution, but in a limited portion of the gland; moreover, the formative exceeds the functional activity, which does not progressively increase, but remains at the lower stage at which "crude products" alone are formed. These latter accumulating rapidly owing to the sluggish functional action, and being the result of *endogenous* growth, which the author lays down as being *heteroplastic*, we have, according to him, all the conditions for the formation of a tumour. Mr Creighton shows further, that the character of the new growth depends upon the degree to which the functional activity has been excited. If it rise to that stage at which mucous vacuolation is found (in healthy evolution), we have the softer forms; if it remain at a much lower intensity, scirrhus is the result.

The circumstance, too, that the unknown diseased excitation most commonly befalls the gland when in a state of rest is laid particular stress upon, as of the first importance in accounting for the formation of a tumour, whether it be a mechanical injury, or sympathy with excitement in the ovaries.

The last chapter is an application to pathology of the "facts" arrived at in Chapter III. on the function of lymphatic glands. The lymphatic glands of the breast being viewed as functional appendages of the secreting gland, their invasion or infection in cases of tumour-disease of that organ are treated as being in a very particular way incidental to their health relationship. This physiological clue to the infection of mammary lymphatic glands has been made use of, in the latter part of the chapter, to illustrate by resemblance and by contrast the general question of tumour-infection, both as regards the primary and secondary tumours of other epithelial organs, and also as regards the primary and secondary tumours of connective-tissue parts.

Mr Creighton contends, in the earlier portions of his work, that it is possible to study the functional processes of a gland so far without experiment.

In the pathological conclusions of his investigation, he points to the utility of a kind of physiology that is neither physiological physics nor physiological chemistry. "The cellular pathology is nowhere more triumphant than in the region of tumours; and I believe, that for every organ or part of the body that is subject to the tumour-disease—not to speak of other diseased processes—there exists a cellular physiology as distinguished from histology, which will always demand a fair share of attention at the hands of the medical profession. However convenient and however philosophical it may be in modern physiology to ignore the individual elements of the body, and to view them in the abstracted form of a protoplasm upon which forces play, or in which chemical changes take place, yet, when we come to the everyday processes of disease, the elements of the body are constantly asserting their individuality, and in the case of tumours they assert it in the most alarming way. It appears to me, therefore, that physiologists owe greater consideration to the cellular unit of the body, and to the spontaneity and self-governing properties of the cell."

If the histological appearances and changes which are figured and described with such painstaking accuracy be capable of the interpretation which our author puts upon them, all our present views as to the embryonic development of glands must, in the first place, undergo a complete revolution, and then our notions as to the origin of the elements of certain tumours, and the laws which govern their formation, must be very essentially modified. But whatever be our estimate of the soundness of Mr Creighton's facts and the justice of his deductions, we cannot but feel the highest admiration for the broad-thinking spirit in which those experiments have been undertaken. The book is manifestly the work of a profound histologist, possessing a philosophic mind. We heartily commend its study to all physiologists, by which we mean the whole of the members of the medical profession.

DEARTH OF CANDIDATES FOR THE ARMY MEDICAL SERVICE.

A COPY of the official report on this subject to the Secretary of State for War, dated "War Office, 22d July 1878," was courteously forwarded to us on 19th ult. by the Director-General of the Army Medical Department. It forms a Blue Book extending to 61 pages folio; 28 of which contain the Report proper of a small and a very efficient Committee, consisting of Mr Ralph W. Thompson, C.B., Under Secretary of State for War; Sir W. M. Muir, K.C.B., M.D., Director-General, A.M.D., and Denham Robinson, Esq., Actuary to the War Office; who had been "appointed by the Secretary of State to inquire into the causes which tend to prevent sufficient eligible candidates from coming forward for the Army Medical Department:" while the rest of the volume consists of five appendices, presenting the material data with which that Committee, at their own special request, were furnished principally by the *Teaching* Bodies of the United Kingdom; and from which Returns the Committee seem largely to have framed their Report.

This Report presents to the Profession, in 105 sections, some well-considered views with regard to the main causes producing deficiency in the supply of well-qualified medical officers, and likewise points out some of the remedies which appear to be called for at the present serious emergency.

In the June Number of this Journal, pp. 1134–1139, are fully detailed both the Primary and the Secondary Causes that contribute to deter the best men from joining the Army Medical Service, and the Committee's Report treats of those grounds of dissatisfaction and complaint that have produced the present dead-lock for Candidates under these two heads:—"FIRST, the alleged grievances of existing and retired Medical Officers; and, SECONDLY, the direct discouragement caused by the calculable prospects in the Department itself." In the Appendices A and D to the Report, will be found, reprinted in a carefully classified form for reference, thirteen Extracts from the comprehensive Letter in our June number, these Extracts amounting in space to three folio columns of the Appendix. Most of these alleged grounds for the existing wide unpopularity of the Army Medical Department, as well as the valuable statements that have proceeded from other Teaching Bodies and from Medical Officers already in the Army, have been anxiously weighed and analyzed by the Committee.

Accordingly, it is somewhat satisfactory to the Profession to find that this carefully-working Committee has in their Report most candidly and fully admitted the existence of the grievances and hindrances complained of, and has proposed remedies for them in cases where the remonstrances made are apparently valid and remediable.

Thus they suggest to the Secretary of State for War many improvements and amendments that ought, they think, to be made in regard to the *duties* to be discharged by Army Medical Officers, the *status* of the latter, their *quarters*, *exchanges*, *leave*, and in particular, their scale of *promotion*; and, further, their increased *pay* where insufficient, together with greater facilities for their *optional retirement*, with a proper allowance of *say* £1250 after years' service, £1800 after 15, £2500 after 18, and a pension of £ a day after 20 years' service, £1, 2s. 6d. a day after 25, and £1, a day after 30 years' service.

It must be added, however, that the relative advantages of the *Regimental System* and *the Unified Staff System* are looked upon by the Committee as a question that has passed beyond the stage of argument, and as not being within the scope of their inquiry. But the social losses to Regimental Medical Officers might, the Committee think, be made up by officers of the several Departments at smaller Stations combining for *Messing and Social Purposes*, Government affording facilities; together with a *Medical Institute and Club* at a few large Stations, Government providing the building with fuel and light, and a limited annual grant towards the formation of a Station Library of Medical Scientific books, Microscopes, etc.

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MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LVII.—MEETING X.

Wednesday, 19th June 1878.—Dr KEILLER, *Vice-President, in the Chair.*

I. *Dr Kirk Duncanson* showed a PATIENT, who suffered from disease of the labyrinth. The first ear symptoms were aural catarrh, with excessive secretion of cerumen. His eyes were affected before any ear symptoms appeared. He suffered from vertigo and deafness, but heard the high and low notes of the piano probably because the cochlea was affected. His hearing and general health are now improving, so that he is able to follow his usual occupation. There existed also in the helix of the left ear of this patient a *fistula auris congenita.* There was no communication between the tympanum and the fistula.

II. *Dr P. H. Watson* showed a PIECE OF TONGUE removed from a boy who suffered from congenital protrusion of that organ. At st efforts were made by means of pressure and astringents to ep this in check, but without effect. Dr Hamilton, of Falkirk, hose patient he was, sent him in some years ago, under his (Dr atson's) charge. Pressure gave relief, but the friends refused allow him to remove any part, and took him away from ospital. When sent in again, he took scarlet fever, during hich the protrusion increased, chiefly from want of protection om the pressure of the lower incisors. He had, that day, cut way the protruding part with the thermal cautery. The larger essels bled, which was an advantage, as it enabled them to be asily secured. The specimen had been examined microscopic-lly by Dr D. J. Hamilton, who reported that the lymphatic essels were dilated, and that there was a large amount of inflam-atory connective tissue present.

III. *Dr Ronaldson* showed the TEMPORAL BONE of a patient who ad suffered from cerebral abscess. A year before he had some unning from the ear; and eleven months after there followed evere pain in the ear and head, vomiting, slow irregular pulse, nd fetid discharge from the ear. On post-mortem examination e found an abscess in the neighbourhood of the right temporo-phenoidal lobe. There was a small opening in the adherent dura ater, and a sinus leading into the tympanic cavity.

IV. *Professor Rutherford* then read a paper on EXPERIMENTS ON HE SECRETION OF BILE, WITH REFERENCE TO THE ACTIONS OF HOLAGOGUES.

The *President* wished to express his deep sense of the value of Dr Rutherford's extraordinary communication. What chiefly passed through his mind while it was being read was the fact of heir great ignorance in administering medicine.

Professor Fraser said that his main object in speaking was simply o repeat what their President had so well said, and to express the leasure with which he had listened to a communication on work performed with such ability, skill, and perseverance. They were indebted to Dr Rutherford for his lucid description of his laborious experiments, and for the abundant graphic illustrations of his results. He felt bound, however, to express his regret at the concluding remarks in regard to the work being now finished. He should be sorry if Dr Rutherford adhered to his resolution not to prosecute his researches further. He had done much disagreeable and tedious work; but as he had done it with such good results, and knew so well how to do it, he hoped he would carry it on. Dr Rutherford deserved their thanks for the great courage with which he had persevered in the midst of obloquy and misrepresentation. He thought that on so special an occasion he would be allowed to propose a vote of thanks.

Dr William Craig seconded the motion most cordially. The paper was not one for discussion, as Dr Rutherford had not entered into the theory of the question, but only given them facts— of them of the highest importance. He had great pleasu seconding the motion.

Dr Andrew Smart did not feel he had any justifiable groun express his opinion apart from his having been asked to do so the President. The exhaustive nature of the paper made discuss difficult. They had been dazzled, he might say, by a series of valuable investigations scarcely paralleled in the history of medi He thought they were quite justified in passing a special vote thanks, and he regretted they could not have a special meetin discuss the paper, as they were not that evening in a positio estimate the value of the work. Dr Rutherford had modestly sa that he had only confirmed previous views, and added some ones. In truth, however, he had made the subject his own, a had stamped the impress of originality on everything he h touched. He had really added new facts in regard to these dru because he had given them certainty. Many of late had beco quite sceptical in regard to some of them, and thus Dr Rutherfo had done good service in putting the working of hepatic remed on a scientific basis. He hoped, with Dr Fraser, that Dr Rutherf would continue his researches.

The *Secretary to the Society for the Prevention of Cruelty* *Animals* expressed his admiration for Dr Rutherford's pap From what he had heard to-night he felt sure he could advan many arguments against those who held strong anti-vivisecti views. He heartily concurred in the special vote of thanks.

Professor Grainger Stewart had often heard of the remarka powers of clear description and lucid statement presented Professor Rutherford, and was sure that every member prese must have been struck as he had been with the manifestation these qualities in the communication to which they had jus listened. He considered it interesting to note how in almo every instance the results of the experiments described confirme those of clinical experience. The research showed that, with th exception of calomel, which was generally regarded as a powerfu cholagogue, all the remedies which practitioners had been accustomed to rely upon for action on the liver, were well worthy of confidence. One of the series referred to was chloride of ammonium, and it was shown to have no marked cholagogue action on the do But it certainly was eminently serviceable in warding off some of the unpleasant effects of iron—effects generally ascribed to action on the liver. He was in the habit of combining it with th tincture of perchloride in cases in which that preparation was not well borne, and the results of the combination were most satisfactory. This research showed that, in whatever way this was brought about, it was not by a cholagogue action. He referred also to several of the cholagogues which he had found valuable, particularly iridin, ipecacuan, and benzoate of soda.

The *President* then conveyed the thanks of the meeting to Proessor Rutherford, remarking that he considered himself fortunate n presiding on this occasion.

Professor Rutherford thanked the President and the members enerally for the warm reception accorded to his communication.

MEETING XI.

Wednesday, 3d July 1878.—Dr SANDERS, *President, in the Chair.*

EXHIBITION OF PATHOLOGICAL SPECIMENS.

I. *Mr Benjamin Bell* exhibited an EYE which he had excised for a malignant growth. The patient, a healthy-looking country woman of 65, had gradually lost sight in her left eye until eleven months ago, when blindness was complete. During the winter she suffered a good deal of pain in the globe, forehead, and left side of the head. Her medical adviser could see nothing wrong with the eye, but her rest was interfered with. About two weeks before she came to Edinburgh the pain ceased, and, simultaneously, a small projection appeared on the upper part of the eye, which has been growing ever since. When she presented herself, the *cornea* was partially hidden by a tumour, firm and with a granulated surface protruding from beneath the upper lid. It had the bulk of a flattened filbert. On a section of the globe and tumour, after they had been hardened in spirits and water, the lens was seen amber-coloured and hard; the space occupied by the *aqueous* and *vitreous* humours was filled with white, firm matter. The hyaloid membrane was at one part extremely detached from the *choroid*, which, or a melanotic structure corresponding to it, was about an eighth of an inch in thickness behind the *ciliary body* at its upper part. The tumour had a reddish brown section, and seemed to spring mainly from the external surface of the *cornea*.

II. *Professor Fraser* showed the LOWER PART OF THE BRAIN from a patient who had died after a brief illness. The patient was a painter, 60 years of age, who, while painting, had suddenly become unconscious, and fell from a ladder one step from the floor, at 3 P.M., on the 6th of July. When seen at the Infirmary, he was comatose, paralyzed, with very contracted pupils, and no reflex action could be excited even when the conjunctiva was touched. The temperature at 4 P.M. was 100°·2; at death, six hours after, it was 105°·2. The symptoms pointed to a brain lesion. From the state of the pupils, a case of opium-poisoning might have been suggested, but the suddenness of the attack opposed this suggestion. The case seemed most likely to be one of hæmorrhage into the pons varolii, and this diagnosis was confirmed by the examination after death, for they would see that a large clot had extended from the fourth ventricle into the substance of the pons varolii.

III. *Mr Chiene* mentioned that he had had a case of NERVE-STRETCHING, where the sciatica was unrelieved. Previous to the operation he had asked Dr John Duncan to introduce needles into the nerve. This had not succeeded, and he had stretched the nerve with the result as he had already stated.

IV. *Dr James* read a paper on THE PHYSICS OF THE BLADDER AND URETERS, which appeared at pages 293 and 406 of this Journal.

The *President* expressed the indebtedness of the Society to Dr James for his paper.

Mr Chiene felt indebted to Dr James for his careful experiments; they could not discuss such a paper off-hand, and they must also be cautious in their remarks on its practical bearings.

The *President* asked what amount of force, acting externally would burst a bladder moderately full?

Dr James thought that a force equivalent to 2½″ per square inch of mercury would do so, if time were given, and the bladder distended.

Dr Blair Cunynghame mentioned a case that had been under his care for retention of urine, due most probably to obstruction of ureter by a renal calculus. In this case, however, the urine was not suppressed.

Dr Keiller alluded to the value of his air-bags in placenta prævia and asked if Dr James had ever tested their bursting power?

Dr Smart asked if Dr James thought it would be possible to determine the law of compensative hypertrophy in cases of continued strain? This would be of the highest interest in regard to the heart and uterus. He was much impressed with the ability of Dr James's paper, and how much physics opened up a new field. Just in proportion as the science of physics was applied to physiology did it make progress. Of this they had many striking instances in the recent developments of human physiology. He hoped Dr James would continue his researches.

Part Fourth.

PERISCOPE.

MONTHLY RETROSPECT OF OBSTETRICS AND GYNÆCOLOGY.

By ANGUS MACDONALD, M.D.

ON THE VALUE OF SUBCUTANEOUS INJECTIONS OF ERGOTIN IN UTERINE FIBROIDS AND CHRONIC HYPERTROPHY OF THE UTERUS. —This is the subject of a valuable contribution by Leopold, in the *Archiv für Gynäkologie*, Bd. xiii. s. 182. Leopold supports Hildebrandt, Winkl, Wernich, etc., as against the late Professor

Martin, of Berlin, and others, maintaining that ergot so employed s of great value in the treatment of uterine fibroids. But he further has employed the same agent with considerable success in the treatment of subinvolution of the uterus and of chronic metritis. It is maintained by him that success depends largely upon the mode of performance and the continuation of the treatment, the selection of the cases, and especially the selection of the preparations Failure, Leopold holds, has followed from neglecting these considerations. According to our author:—The form of fibroid that gives best results is the interstitial, although advantage may be expected in the way of lessening hæmorrhage, and promoting ultimate expulsion of the tumours in submucous fibroids. Cases are unsuitable in which the uterus is incapable of contracting; therefore there is no use of employing the injections when there is any false membrane or exudation binding down the uterus, or when it contains a fattily degenerated or calcareous tumour, when its muscular fibres are atrophic, or its bloodvessels degenerated. Tumours in the body of the uterus are more benefited by the treatment than those in the neck. Great care is to be employed also in selecting for treatment cases of subinvolution or chronic metritis. Every case in which there exists pelvic exudation is to be rigidly excluded, also if there is a polypus in the uterine cavity. The best preparation Leopold finds to be Wernich's extract dissolved in four parts of distilled water. After trial he has found that the addition of glycerine, salicylic acid, carbolic acid, or morphia is objectionable. He recommends that the solution should be very frequently renewed, as it is apt to get mouldy. The best situation for injection, according to Leopold, is by the side of the navel, the canula being inserted deeply into the abdominal wall. The injections ought to be made very slowly, and a cold compress ought to be immediately applied to the part, whilst the patient ought to keep lying on her back for several hours afterwards. The injections ought to be continued for a considerable time,—30–120 in each case,—if they are well borne. They should be made almost uninterruptedly each day, especially and intentionally during the menstrual flow. With diminution of the bleeding the periods between the injections may be lengthened. Leopold records 12 cases, in which he had employed the ergotin injection. There was no improvement in 3 of these, = 25 per cent. There was essentially less bleeding without appreciable diminution of the tumours in 5 = 42 per cent. There was notably shrinking of the tumours in 4 = 33 per cent. So that he concludes that 75 per cent. gave evidence of improvement. Our author also gives the results obtained in 14 cases of chronic hypertrophy of the uterus, 8 of which he classes as examples of subinvolution, 5 as examples of chronic inflammation or metritis, and 1 as exfoliative endometritis (dysmenorrhœa membranacea). In those 14 cases the chief effect noticed was sooner or later diminution of the sanguineous discharge at the periods; the time required for the treatment varied from 1 to 6 weeks in cases of subinvolution, to several months in cases of chronic metritis. If decided advantage did not occur in these cases after 50–60 injections, Leopold thinks that it is useless to continue longer injecting the ergotin, and other means must be tried. In the majority of Leopold's cases the ergotin injection was accompanied by an improvement in the patient's general condition, strength, and appetite. The particulars of the *sectios* of the uteri of two patients who had been treated for fibroid tumour by this method, and who had died from disease in no way connected with the fibroid tumours, are then given. The examination of these tumours unmistakably prove, according to Leopold, that under the use of the ergot the tumours had been compressed, their vascular supply very largely cut off, the tumours themselves rendered anæmic, whilst fatty degeneration had commenced in their muscular elements.

Forcible Dilatation of the Cervix Uteri for the Relief of Dysmenorrhœa and Flexions is the title of a short paper in the *New York Medical Journal* for April 1878. The author writes in the usual style of mechanical gynæcology—disapproves strongly of incisions of any kind being made in the cervix, as also of gradual dilatation by bougies, but believes that forcible dilatation to suddenly open the cervix to the amount of ¾ to 1 inch, and the subsequent use of a stem pessary, will do wonders. The records of 11 cases so treated are given.

A Peculiar Condition of the Cervix Uteri which is found in Certain Cases of Dystocia, is the subject of an interesting paper by Dr Alfred Hesmer, in the *Boston Medical and Surgical Journal* for March 1878, p. 360. Records of four cases are given. They all presented what appeared to be a strictured part of the uterus passing transversely round the circumference of the organ during delivery, at a level above the outer os uteri equal to about one-third of the whole distance between the outer os and the fundus. The cases presented difficulty both to forceps and to turning, particularly to the latter, as the portion of the child at the constricted part and above it was found very closely grasped by the uterus. The cases are explained by the author as examples of extreme yielding of the cervical segment during a difficult labour, the mechanism of which has been pointed out by Bandl more especially, but also by Dr Matthews Duncan and myself. The hour-glass contraction, passing round the body of the uterus, would therefore be nothing more nor less than the lower edge of the body of the uterus. The cases are, doubtlessly, explained correctly on these grounds, and belong to a class that was wont sadly to puzzle gynæcologists, although we feel certain from personal experience that they were never specially rare.

On the Administration of Ergot in Labour is the subject f an interesting paper by Dr Fritz Benike, of Berlin, in the *Zeit-*

schrift für Geburtshulfe und Gynäkologie, Bd. iii. s. 173, which, after a historical and critical examination, concludes with the following propositions:—1. During the first stage of labour ergot must not be administered under any circumstances. 2. Even during the second stage it is best not to administer it. However, the prescription of it is permissible in reference to an unfavourable third stage, provided we have to deal with head presentation, the head being well down, whilst the soft parts are well prepared—circumstances which permit us to extract by forceps at any moment. Pelvic presentations and abnormal presentations of the child are here also to be regarded as absolute contra-indications, likewise abnormalities of the pelvis and of the soft parts. If we administer ergot during the second stage, an accurate observation of the fœtal heart's sound is above all required, since, in consequence of interference with the circulation in the uterine walls, the life of the child is frequently endangered. 3. Bleeding from the uterus during pregnancy, or the two first stages of labour, offer no indication for the administration of ergot. If its employment in bleeding in cases of abortion is not absolutely to be rejected, although in this case we possess much more effective means, bleeding in connexion with placenta prævia, and in consequence of separation of the placenta when normally situated, contra-indicate its being prescribed. Secale is only to be prescribed as an active therapeutic agent when we have to deal with defective contraction of the empty uterus.

ON THE PROPER TIME TO CUT THE NAVEL-STRING is the subject of a highly interesting article by Dr M. Hofmeir, in the *Centralblatt für Gynäkologie,* 31st August, 1878, which, both on account of the little attention the subject has received in this country, except from Dr Duncan and his pupils, and also from its own intrinsic importance, I take the opportunity to translate *in extenso.* It appears to me that after a perusal of its contents most obstetricians will be inclined to adopt the practice of delaying the cutting of the cord till after the placenta is expelled, provided no reason is present necessitating haste.

"In consequence of the works of Schücking, Illing, and Zweifel, the question of the ultimately most favourable moment for cutting the cord has come to be discussed anew. The statements of Zweifel, that by not dividing the cord until after expulsion of the placenta, we can convey to the child 100 grammes (1543·23 grains, or 3·527 oz. avoird.) more than by the old plan, appears *a priori* very improbable, with an entire blood mass of 175 grammes in a fœtus of 3300 grammes.

"With the permission of Professor Schroëder I have therefore attempted to answer anew this question, and to establish the observations made by means of direct weighings on the bed, which to me seem to be more certain than the subsequent determination of the blood contents of the placenta.

"The child, before its navel-string was cut, was twice weighed on an accurate decimal balance—the one time immediately after its expulsion from the genital passage, the other time after the expulsion of the placenta. Out of 32 children weighed in this fashion, among whom, moreover, all external conditions were as natural as possible, I was able to establish an increase of 33·6 grammes. That this was occasioned by an increase of sanguineous constituents appears to me impossible to be doubted.

"Greatly more difficulty is experienced in answering the question which immediately follows the above fact, viz., whether one brings any advantage to the child by an increase of its mass of blood, and whether one may not in this way do it harm.

"To answer the last objection first, it may be briefly advanced, that I could never observe any direct injury of the child's organism.

"In the estimation of the first point there are two possibilities to be considered, viz., whether the increased quantity of blood is useless in the child's body, in which case, by rapid destruction of the red corpuscles, and excretion of the superfluous serum, the excess is again equalized; or whether it is advantageous to the organism, in which case it serves the child during the first days of life, when it lives at its own expense, like a blood reserve, and thus lessens the loss of weight and strength during the first days.

"To be able to answer these questions with more certainty, the methodic weighing of a large number of newly-born children, who are placed under the most similar external relations, seems to me in many respects very advantageous.

"I have attempted to do this, by instituting two series of weighings, independently of one another, of which the first embraces fifty, the second forty children. In both series the one-half of the children (therefore in the one case 25, in the other 20) had their cords cut before the expulsion of the placenta according to the usual method, the other half after the expulsion of the placenta. By careful selection only normal children of healthy mothers were employed. These were again weighed daily, and then the average numbers expressive of the loss of weight and of the latest period of the diminution in weight of body, were calculated.

"Both series of weighings have given us almost the same results, namely, that the children whose navel-strings were late in being cut, therefore, after the expulsion of the placenta, lost less by about 1 per cent. of their entire weight than those whose navel-strings had been divided early.

"A child of 3300 grammes would therefore lose less by 33 grammes. We can certainly have no doubt that this slight diminution indicates a direct gain in blood and strength. Also the period of the commencement of increase in weight of body appears to fall somewhat earlier in those whose navel-strings are late in being divided than in those in which division was performed early. It oscillates in both tables from $\frac{1}{8}$ to $\frac{1}{2}$ per day in favour of the former.

"It may be briefly pointed out, that a series of microscopic obsertions of the blood gave certainly no ground of support for the inion of there being a rapid and early decomposition of red-blood rpuscles. Also, I could observe no greater intensity of the icterus an usual.

"More extended communications will appear in the next number the *Zeitschrift für Geburtshülfe und Gynäkologie.*"

ACCOMMODATION OF THE FŒTUS DURING PREGNANCY.—In the *nnales de Gynecologie* for May and July of the present year, Dr 1. Pinard contributes a long article upon this subject, which, while contains very many assumptions and statements that are decidedly roneous, is yet a great advance upon the small volition theory of ubois, and is a powerful exposition of the subject from the point view taken up by the author. The paper commences in the llowing terms:—"The results which I register every day examining pregnant women by the aid of palpation practised uring the different periods of pregnancy, have convinced me iat the history of the fœtus during intrauterine life relative to s different situations and attitudes is not sufficiently known. It esults from my numerous examinations, that, during pregnancy, ne law rules the relation of the fœtal organism with the maternal rganism. This law, which presides over the accommodation durng pregnancy, is absolutely similar in its causes and in its results o the law of accommodation of labour, so succinctly and so well ormulated by Professor Pajot:—When one solid body is conained in another, if the body contained is the seat of alternations of movement and of repose, if the surfaces are smooth and not very ngular, the body contained will tend incessantly to accommodate its shapes and dimensions to the shapes and capacities of the containing body. By this law the preservation and the positions in normal nd distorted pelves are regulated. It is to the study of this law that I wish to consecrate the first part of this work, calling to my aid anatomy, physiology, and the results furnished clinically and statistically."

Dr Pinard then proceeds to examine this important question from this point of view, and in so doing, arranges his treatment of the subject under the four following heads:—

1st. The normal attitude of the fœtus in the uterine cavity.

2d. The relations of the fœtus to the uterine cavity.

3d. The relation of the gravid uterus to the abdominal cavity and the pelvic cavity.

4th. The accommodation of the head of the fœtus in the (pelvic) excavation during pregnancy.

Under the first head, after enumerating the relation of the parts of the fœtus to one another in the manner usually employed, the author states that the form of the fœtus, thus doubled upon itself, represents exactly an ovoid, of which the great extremity is constituted by the pelvic extremity, along with the lower limbs, and the small by the cephalic extremity flexed. . . . . . Apart from the active movements, which possess no permanency, the fœtus may and ought to be considered in the uterus as a living but passive being. . . . . . The fœtus rounds off its angles in flexing and shortening itself; every pressure which it supports, partial or general, due to the uterine contraction or to the contraction of the muscles of the abdominal wall—every movement which is impressed upon it by the material organism—has for its result not to smooth but to flex it, seeing that it cannot extend itself. It is then that from time to time the fœtus, seeming to react against its passivity, accomplishes sudden movements, of which the cause is certainly physical or physiological, and in which one or several limbs appear to escape from this law, but always in a relative and fleeting manner. Then the causes of the attitude of the fœtus are all material, and depend much more upon the pressure which it supports than upon the individual.

In considering the second head, after a lengthened historical reference to the various theories entertained upon this subject from Hippocrates to the present day, Dr Pinard maintains that the relation of the fœtus to the uterine cavity—that is, the position it assumes in the uterus—is due to several causes, but does not believe that gravity is the only, or indeed the main, cause. He refers it rather to his assumed principle of material accommodation, the fœtus adapting itself to the growth of the uterus by a sort of parallelism, the large or pelvic end of the fœtal oval being received into the large or fundal end of the containing uterus, and he then goes on to say, "During the duration of pregnancy there exists painless uterine contractions, and it is proved that when the uterus contracts it shortens its transverse diameters and increases its longitudinal. Moreover, no woman remains immobile during the whole period of pregnancy, and those movements of the mother are repeated more or less on the fœtus."

Here are the alternations of movement and of repose. The most internal wall of the ovum, which is in relation with the fœtus, is the amnion, of which the inner face is uniform and slippery. Between the fœtus and the uterine wall there exists the amniotic liquid, of which the quantity varies. The fœtus has its parts more rounded than angular; we find, from the fifth month onwards, that the skin is covered with sebaceous matter, which can only favour its slipping; then, if the law is true, the form of the uterus and of the fœtus render accommodation possible, the polish of the amnion, the amniotic liquid, the rolled-up condition (pelotonnement) of the fœtus, the lubrification of its skin, and the movements of the mother, and even those of the fœtus itself, bring them into action.

During the first six months of pregnanoy, thanks to the amniotic liquid, the fœtus enjoys a certain liberty, and it is easy to make it roll about, as we have often done, but after some time it assumes its position. This is because at this time the total volume of the uterus much exceeds that of the fœtus, so that the tendency to

:commodation is not imperious or necessary, as it becomes afterards.

Under his third head the author criticises severely the ordinary ractice of neglecting the effect of the abdominal walls in dealing ith the question. He maintains strongly that the frequent conactions of the muscles of the abdominal walls and their permanent nicity compel the uterus in primiparæ from the seventh month onward elongate itself in the mesial line only, and make its great axis always ngitudinal. In proportion as the uterus and its contents develop, ie pressure which it supports becomes more and more intense. In iis way the head, covered by the lower uterine segment, is flexed nd pushed down into the true pelvis during the latter months, nd thus the position is fixed.

In multiparæ the abdominal walls are lax, and this fixation does ot take place till labour comes on, or about a week before it. He hen further states: "I forgot to add, that between the non-ngagement of the fœtal part and the complete engagement there ccur intermediate conditions, which vary infinitely, and which are lependent upon the more or less degree of elasticity and laxity of the bdominal wall. This last acts not only so as to place the great xis of the uterus, and consequently that of the fœtus, in the median ine, but further, in making the head of the fœtus dip into the xcavation, of insuring the stability of the presentation. There is, hen, not only coincidence—parallelism of the three axes, uterine, œtal, and pelvic; but still more, conjunction, penetration, whence esults only a fixed presentation. This condition, not being able o be fulfilled in the case of placenta prævia, pelvic tumour situated n the lower uterine segment, and in pelvic deformity, it results that n these cases changes of presentation are frequent during the whole luration of pregnancy, and that at the time of labour the presentation f the breech and of the trunk are relatively frequent. Proof that the osition of the fœtus is less fixed in multiparæ, and under the other ircumstances named, are then given from the author's observations, and from the writings of other observers.

Under the fourth head Dr Pinard maintains that the fœtal head when it enters the pelvis during pregnancy, in doing so submits to the reaction of the hard pelvis upon it, and not of the soft parts, and that, in accommodating itself to this reaction, it is subject (1) to a movement of flexion, and (2) to a movement of rotation, by which the shorter diameters of the head are made to engage in the shorter diameters of the pelvis, and antero-posterior diameters of the head are brought to coincide with the long oblique diameters of the pelvis.

These arguments are also supported by reference to observation and statistics.

The second part of the paper is taken up with an attempt to apply these assumptions and data in explanation of the origin of the various fœtal presentations.

As to the presentation of the vertex, he maintains that the causes of it are all material and physical, and in dependence up the numerous factors, of which the result is accommodation.

They reside neither in the great weight of the cephalic extr ity of the fœtus, nor in the fœtal circulation, nor in indirect vol

They are of two classes—active and passive.

The passive are—The form of the uterus and of the fœtus, th slippery surface, pressure of the amniotic liquid, parallel between the development of the fœtus and that of the uterus, shap of the pelvic excavation.

The active are—Active movements of the fœtus, tonicity contraction of the uterine muscle during pregnancy, tonicity a contraction of the abdominal wall.

When one or more of these causes are at fault, the vertex ma still present at the moment of labour, but if so, it does so accide ally or gradually.

In regard to presentation of the face, Dr Picard holds that th are never primary, nor can be, but secondary, arising dur delivery. As regards Madame Lachapelle's two cases, where the fac was found presenting after death, although the mothers had d before labour, Dr Picard thinks the children at death must hav been convulsed. The other evidences of primary face-presentati from Dubois and Desormeaux he thinks are inconclusive. He believ the face is a presentation of labour and not of pregnancy. The pr disposing cause is an absence of pelvic accommodation. All t causes which do not urge towards pelvic accommodation duri pregnancy, or which prevent it, favour the production of presentati of the face; ill-directed uterine contractions, such as obliquity of t uterus, determine it.

As to the breech, he divides it into two forms:—

1. Natural presentation of the breech (franche).
2. Accidental presentation of the breech.

The former he regards as rare, and due to a defective development of the collective elements that make up the pelvic extremit of the fœtal oval, or to an excessive development of the cephal end as from hydrocephalus, or to an excessive development of th lower uterine segment. By any of these peculiarities the adaptatio of the large end of the fœtal oval to the large part of the uter does not produce presentation of the vertex, as it usually does, but o the breech.

Accidental presentation of the breech Picard holds to be due t the breech being accidentally caught in the brim at the moment o the commencement of labour. To this cause he ascribes the great number of breech cases.

Presentation of the trunk he likewise divides into natural (franche) and accidental, and groups their causes as follows:—

1. A uterine malformation, which renders the development o that organ irregular, produces an accommodation such that th fœtal and uterine axes, although parallel, are perpendicular to th pelvic axis. (Natural presentation of the shoulder.)

2. The absence of the factors of accommodation, relative or absote smallness of the fœtus (premature delivery or hydramnios), aceration of the fœtus, multiple pregnancy, deformed pelves, and regular insertion of the placenta preventing pelvic accommodaon during pregnancy, abnormal laxity of the uterine wall—produce e accidental variety.

Ovarian Pregnancy.—In the July number of the *Annales de ynécologie*, Dr Albert Puech sums up a paper on ovarian pregancy with the following conclusions:—

1. Ovarian pregnancy exists, but till now has only been rarely served.
2. The greater number of cases noted under this heading are ther dermoid cysts or ovario-tubal pregnancies, or, lastly, abdomial pregnancies in which the placenta has become attached to the urface of the ovary.
3. The anatomical characters by which ovarian pregnancy is ecognised are:—(*a*) Absence of the corresponding ovary. (*b*) nion of the fœtal sac to the womb by the ligament of the ovary.) Presence of ovarian tissue in the walls of the sac. (*d*) The allopian tube being distinct from the fœtal sac.
4. Two varieties are distinguished according as the fœtus deveops in a Graafian vesicle, which remains open or immediately huts after fecundation has taken place.
5. The course and termination of this pregancy does not materilly differ from those of abdominal pregnancy.
6. Gastrotomy is the only rational treatment when the pregnancy as reached term.

ONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

y **William Craig**, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

ELLADONNA IN INFANTILE DISEASES.—In a clinical lecture elivered at the Hôpital des Enfants Malades, M. Jules Simon ave the following summary of the physiological action of bellaonna. In some respects the action of belladonna is opposed to hat of opium. Applied locally to a blistered surface of the skin, r to the mucous membranes, belladonna is irritating, as is shown y the action of a strong solution of atropin on the conjunctiva. Hence it has been placed amongst the acro-narcotics. In small oses, by its action on the pharyngeal mucous membrane, it prouces dryness, inability to speak clearly, and dysphagia, and in large doses it causes nausea, vomiting, and diarrhœa. At first the pulse is rendered slower and harder, but with a higher degree of action the pulse becomes full, strong, and frequent; the temperature rises a little; there is redness of the face and brightness of the eyes, with mydriasis. The respiratory movements are rendered more active, and the bronchial secretion is diminished, hence its utility in humid asthma. In very large doses the respiration becomes gasping and convulsive. It is eliminated rapidly by the kidneys, and augments the urinary secretion. It diminishes the secretion of the sweat, and sometimes produces incomplete cutaneous anæsthesia. Its action on the skin in producing a scarlatinal form of eruption, chiefly affecting the face, is well known, and the exanthema disappears after a few hours without desquamation. Speaking generally, it appears at first to excite the vaso-constrictors, in consequence of which there is diminution of the secretions, retinal and cutaneous anæsthesia, and in part, perhaps, dilatation of the pupil. The blood-pressure and the urinary secretion are augmented. In large doses the vaso-motor nerves are paralyzed, and insomnia, agitation, and delirium occur. M. Simon frequently prescribes it with success in hooping-cough and other nervous diseases (*Le Progrès Médical*, 8th June).—*The Practitioner*, September 1878.

DAMIANA (TURNERA APHRODISIACA).—Dr Summerlin of Sunhill, Ga., states that having seen this drug recommended for its aphrodisiac virtues, he determined to give it a trial in the case of a patient, aged twenty-seven, who applied to him for treatment. The patient stated that a few years previously his right testicle became inflamed, compelling him to remain at home for several days. After the swelling left, the testis became atrophied and tender to the touch. He had previously practised onanism. The sexual desire had nearly left him. On examination, the left testis was found to be soft and very small, the other normal. He was placed upon the usual treatment—nourishing food, nux vomica, iron, and cantharidis; but he did not appear to improve. He was then ordered to take one drachm of fluid extract of damiana three times a day. In a short time the testis began to enlarge and lost its sensitiveness. In the course of a month it had regained its normal size, and its functional activity was restored (*Virginia Medical Monthly*, June 1878).—*Practitioner*, October 1878.

THE PHYSIOLOGICAL AND THERAPEUTIC ACTION OF JABORANDI.—O. Kahler gives as the result of his observations on jaborandi that, given in moderate doses, it produces approximation of the far point, diminished blood pressure, as shown by Marey's sphygmograph, with secondary increase in the rapidity of the pulse. When given in large doses it causes retardation of the pulse, with at first lowering, but subsequently increase, of the blood pressure. The slowing of the pulse depends on an exciting action, opposed to that of atropin, exerted upon the inhibitory ganglia in the heart (Leyden came to the same conclusion in regard to pilocarpin.) He established its antidotal action to atropin, but found that it is much feebler than this poison. As a general rule he prefers the subcutaneous injection of pilocarpin in maximum doses of 0·024 of gramme, when jaborandi has to be used internally. In diabetes ellitus he observed no action exerted by jaborandi on the quanity of sugar excreted, providing the digestion was not interfered ith. In a case of diabetes insipidus, on the other hand, the adinistration of the drug reduced the quantity of urine in three ays from 6·8000 grammes to 2·3000; the body weight of the atient did not undergo any increase, but the general health and trength improved materially. In bronchitis acuta, and in chronic, ry catarrhs, Kahler recommends this remedy strongly, and specially also in parotitis occurring in the course of severe infecious diseases, and suggests that it should be tried in mumps. He onsiders that the affections in which it is likely to prove useful re rheumatic diseases, recent neuralgia, dropsy without cardiac ebility (the existence of such debility being a contra-indication), ydræmia and nephritis, uræmia, and lastly, chronic metallic poisoning (*Prager Med. Wochenschrift*, Nos. 33 and 34, 1877; and *Centralblatt f. d. Med. Wiss.*, 27th April 1878). — *Practitioner*, October 1878.

ATROPIN AND DATURIN.—The *Boston Journal of Chemistry* for August 1878 says that in 1850 A. Von Planta asserted that atropin and daturin were identical. This assertion led to mischief, for the manufacture of atropia was soon begun from the leaves and seeds of the Stramonium. Hence the uncertainty of certain specimens of atropin for daturin has been found to be less active than atropin, and more uncertain in its action.

Schroff found in 1852 that the medical action of the two alkaloids was similar, but that the atropin was twice as powerful as the daturin. Erhard found that the crystalline forms of some of their salts were different in 1860. Recently Poehl has shown that atropin is optically inactive, while daturin turns polarised light to the left, its specific rotating power being 14·12 degrees. Platinic chloride precipitates the salts of atropin, but not those of daturin. Picric acid, on the contrary, precipitates daturin salts, but not those of atropin.—*Detroit Lancet*, September 1878.

THE USE OF ERGOT IN TYPHOID FEVER.—M. Duboné of Pau recommends ergot for typhoid fever, for reasons deduced from its physiological action; and in one of his works cites seven cases in which it was employed. Two were in the early stages, and presented all the characteristic symptoms of the malady; but they got well so soon that it was thought that an error in diagnosis was possible. In three others ergot was not used until after all other medicinal resources had been exhausted and the patients had reached an almost hopeless state. But they all recovered after taking from a gramme and a half to three grammes of ergot daily for about two weeks. Another who presented grave ataxic symptoms from the outset, with delirium, trismus, carphologia, and intermittent pulse, took ergot for twelve days, the disease assuming a milder form, and recovery following. Finally, a patient w typhoid fever, who was three and a half months pregnant, w treated with ergot for fifteen days, and got well without miscarriage, although she took a daily dose of a gramme and a half or t grammes of the drug (*Boston Medical and Surgical Journal*, 2 March 1878).—*Practitioner*, October 1878.

Ergot in Trichina Disease.—Dr Rohde relates, in the *Berli- Klin. Woch.*, a case of trichinosis, in which severe bleeding of t nose occurred, and in which he prescribed extract of secale cornutum as a styptic. The hæmorrhage was immediately arrested, an with this, rapid improvement of the general symptoms also occurre This result led him to prescribe ergot in other cases of the disea and in all instances distinct improvement followed. He believe therefore, that we have, perhaps, in ergotin a means of treatme which, without having any marked effect on the human econom may prove fatal to trichina and their offspring.—*Medical a Surgical Reporter*, September 1878.

Action of Iodoform.—Dr Sigmund of Vienna has use iodoform with very successful results in ulcerative and indurative processes, glandular swellings, rhagades, and gummatta. He employed the following formulæ: iodoform and spirit, each 1 part; glycerine, 5 parts; or 1 part of iodoform in 3 or 4 of sugar; or 1 of iodoform in 5 of vaseline; or iodoform collodion (1 in 1 or 1 in 15). The pain was unimportant; the surfaces of the sores became clean in from twenty-four to forty-eight hours and granulated favourably. The offensive smell of diphtheritic and cancerous ulcerations was entirely removed by the remedy. Dry iodoform in powder applied to fresh wounds forms a uniform firmly adherent paste (*Deutsche Med. Wochenschr.*, 10th August).—*British Medical Journal*, September 1878.

PERISCOPE OF OTOLOGY.

By J. J. Kirk Duncanson, M.D., C.M., F.R.C.P., and F.R.S., Edinburgh, Surgeon to the Ear Dispensary, 6 Cambridge Street, Lothian Road; Assist.-Surgeon, Eye Infirmary; Lecturer on Diseases of the Ear, Edinburgh School of Medicine.

Laminated Epithelial Plug in the External Auditory Canal.—Wreden of St Petersburg first described this disease in the *Archiv of Ophthalmology and Otology*, 1874, and named it *keratosis obturans* in contradistinction to *ceruminosis obturans*, the impacted plug of ear-wax most frequently met with. Ceruminosis obturans consists of a mass of inspissated cerumen easily removed by proper syringing, whilst it dissolves readily in water. Keratosis obturans is a collection of epithelial laminæ, derived from the horny elements of the cutis of the external auditory canal, of gradual accretion, causing great deafness, and offering great resistance to removal. These obstructive bodies are not confined to any age or sex. Upon inspection of an ear containing keratosis obturans, a thin layer of ordinary cerumen may be seen covering the outer surface of the mass, leading one to consider it as a case of ordinary ceruminous impaction. But continued syringing, by its barren results, soon convinces the operator that he has encountered no ordinary obstruction. Dr A. J. Blake of Boston, to enable him to remove the mass in two cases of keratosis obturans where he was unable to remove it by the ordinary means of syringing alone, wrapped one end of a probe with cotton wool which he dipped in a saturated solution of bi-carbonate of soda, then passing the probe between the mass and the walls of the meatus, the disease was thus loosened from its attachments, and could be easily removed by syringing. Injury to the walls of the external meatus or drumhead is apt to arise from this method, and it is better, on ascertaining that one has to do with a case of keratosis obturans, to frequently drop into the affected external auditory meatus each day 10 to 15 drops of a pigmentum, consisting of half a drachm of bi-carbonate of soda, 10 drops of carbolic acid, half an ounce of glycerine, with water to one ounce, warmed, for four or five days, after which the mass will be readily removed by syringing with tepid water, containing 2 drachms of bi-carbonate of soda to the quart. Instead of the above pigmentum, one containing half a drachm of the liquor sodæ chloratæ to one ounce of water may be used in the same manner, *i.e.*, carefully dropped into the affected external auditory meatus three or four times a day after being gently heated.—See *Archiv für Klinische Chirurgie*, June 1877, and Burnett's *Treatise on the Ear*, p. 293, 1877.

PRIMARY OTITIS EXTERNA DIPHTHERITICA.—According to Dr Kraussold, we can have no primary affection of the external auditory canal with diphtheritic disease unless there exists some excoriation of the canal. He relates a case occurring in a woman of 22 years of age, who, for several weeks, had suffered from otitis externa with a slight serous discharge. There arose in the right ear, preceded by a feeling of general depression, a violent pain, accompanied with noises, difficulty of hearing, and a feeling of fulness in that side of the head, with great itchiness in the external auditory canal. The external auditory canal was almost entirely filled with grayish white masses like epidermal scales, which could neither, by syringing nor without causing great pain, be removed with forceps. A watch heard at a distance of 90 cm. by a normal ear could only be heard by the right ear of the patient at a distance of 5 cm. The application of the air-douche caused in the right ear a loud rattling noise without improving the hearing of the patient, but giving rise to considerable pain in that ear. After removing a piece of the obstructing mass from the canal, its surface was found intensely reddened, swollen, partially excoriated, and very painful. The evening temperature was 38·7 Reaumur. On the following day a membrane similar to the former was spread over the excoriated part. No direct infection of the part could be traced. For several months diphtheritis had been prevalent in the town. On the fifth day a membrane was removed forming a cast of the external auditory meatus and drumhead something like the finger of a glove. After three days the excoriated part was again covered. This was removed seven days afterwards. Microscopic examination of the second membrane removed showed a very soft pulpy mass of net-like fibres sparsely interspersed with round cells; at the edges of the pieces there were pus-corpuscles and epidermis cells. Typically arranged micrococcus masses could not be found.

THE AGGLUTINATIVE METHOD OF REMOVING FOREIGN IMPACTED BODIES FROM THE EXTERNAL AUDITORY MEATUS.—Dr Löwenberg of Paris has recently revived a method that was fully described by Riverius in the *Opera Med. Francofurti*, M.D.C., lxxiv., cap. de Surditate, p. 261; and by Celsus. (See the Strasbourg edition of his works, 1806, p. 342.) Rau also describes the agglutinative process, *Opera Med. Francofurti*, p. 375. The process consists in smearing with glue or some equally tenacious substance (coaguline is very good), a piece of linen, cotton cloth, or the like, firmly attached to a handle. This is brought into contact with the foreign body in the ear, and then allowed to remain until perfect adhesion takes place. In most instances the foreign substance can then be lifted out of the external auditory meatus. A somewhat similar method is to apply to the foreign body a piece of adhesive plaster, firmly secured to a string. Warm the miniature disc of adhesive plaster by means of a "burning glass" or heated wire passed inside of an aural speculum. When adhesion has taken place, traction on the string may remove the foreign body attached to the adhesive plaster. Either of these methods are suitable in cases of impacted glass-beads, stones, the smooth round tops of ivory pens, etc., or in cases of carob seeds before or even after germination has taken place. Germination does not readily take place, unless where some moisture exists in the external ear-passage, which in an otherwise healthy ear is only apt to occur from meddlesome interfering with instruments. Failing the removal of the foreign body by means of syringing, the agglutinative method ought to be employed.—*Berliner Klin. Wochenschrift*, Nos. 9, 10, 1872.

EPILEPTIFORM SYMPTOMS FROM IRRITATION IN THE EXTERNAL AUDITORY CANAL.—It is well known that irritation set up in the external auditory canal by the presence of a foreign body will produce epileptiform and even paralytic symptoms. This is amply confirmed by the experience of Fabricius Hildanus, Toynbee, Von

Trœltsch, Wilde, Handfield Jones, Hillairet, Moos, and others. It therefore becomes of the highest importance to examine the ear among other organs in a case of epileptiform disease of doubtful origin. The possibility that the ear, or a foreign body in it, may have something to do with the disease in question, should lead every physician to examine this organ or have it examined. It would be but safe to examine the ear as often as the pupil of the eye.—*A Treatise on the Ear*, by Charles H. Burnett, A.M., M.D., 1877, p. 326.

Foreign Bodies in the Eustachian Tube are extremely rare. Their removal may, perhaps, be effected by reversing the action of the air-bag and withdrawing air from, instead of forcing it into, the tube. Mr George Field relates a case of a pin in the eustachian tube, which was got rid of by causing the patient to eat a quantity of bread and swallow it in large pieces.—*Medical Times and Gazette*, 16th February 1878.

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Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*An Improved Method of Treating Club-foot.* By ALEX. OGSTON, M.D., Surgeon to the Aberdeen Royal Infirmary.

THE treatment of congenital club-foot (Talipes Equino-varus) is one of the most difficult, tedious, and disappointing undertakings in the whole range of surgery.

The array of mechanical appliances that have been invented and recommended for it, and the number and variety of plans in favour with the various orthopædic surgeons, sufficiently point out that no perfect, easy, and universally applicable method has as yet been devised. The truth of this is soon borne sharply home on all those who have to undertake the direction and management of these deformities. The young surgeon, starting with the idea that the difficulties in the way are neither very serious nor important, commences his connexion with them with a confidence and hopefulness that are very soon rudely shaken. He finds that, after all his most carefully-planned and skilfully-performed tenotomies, carried out according to the advice of the ablest and most experienced writers on the subject, much, and the most difficult of all, remains to be done. He uses one method after another, tries one splint or apparatus after another, employs all the various taliverts and boots that have been recommended, improves on these, or devises new ones for himself, and, as his cases become numerous and his experience extensive, comes at last to the conclusion that we are yet far, very far indeed, from having attained to anything like a satisfactory solution of the problem, how to cure club-foot.

One great truth, often overlooked, is at the foundation of most of the disappointments experienced. The pernicious doctrine, that ordinary congenital club-foot depends on paralysis or contraction of certain muscles and fasciæ, is still tolerated in the profession, and believed in by the laity. Consequently, a cure, or at least a marked improvement is too confidently expected to result from the operation of subcutaneous division of these structures; and tenotomy occupies the most prominent place in the minds of those interested in the progress of the case. But, in truth, division of resisting structures is one of the smallest and least weighty factors.

If we consider for a moment the true pathology of club-foot, we find ourselves in a better position to estimate the difficulties to be overcome and to give a correct prognosis as to the time and trouble that its cure necessitates. In an infant born with the deformity there exists, properly speaking, neither paralysis nor contraction. The whole limb is distorted, and every structure in it contributes its relative share towards producing the deformity. The skin of the foot and leg, if taken off and stuffed, will assume the clubbed form. The muscles, the tendons, the fasciæ, the very vessels and nerves, are all altered in length to suit the deformed foot and leg, but no trace of disease, nor of paralysis or contraction, exists in them. If we were to take away all the muscles, fasciae, vessels, and nerves, the bones and ligaments would still exhibit the distorted shape characteristic of the disease; and if, after removing all the ligaments, we were to articulate to each other the cartilaginous bones that remained, we could do so only in the deformed position. Hence it has to be borne in mind that *every structure in the limb*, without any exception, *contributes its share towards keeping up the malformation, and has to receive its share of the treatment.* Certain it is that some tissues, especially the tendo Achillis, require to be cut by the surgeon, because they, from their powerful structure, resist any other means at his command to restore them to the length they must have ere the limb can be brought into a normal posture; but their division is no essential part of the proper plan of cure, and is resorted to only as a convenience, as an adjunct, often a very necessary one, to the treatment. The treatment proper consists in fulfilling the indication of gradually bringing the limb into the right form, and adapting the means of cure so as to fulfil the indication of a gradual moulding of bones, ligaments, muscles, fasciæ, nerves, vessels, and skin, into a form that shall approximate, as far as possible, to that of a sound leg and foot. Whosoever treats club-foot on any other plan treats it mistakenly and unscientifically.

It is unnecessary here to discuss the question whether club-foot is a result of intrauterine pressure on the foot, or of a non-development of the limb through its failing to go through the normal process of unrolling which, in the fœtus, proceeds downwards along the whole lower extremity and, from the posture it occupies in the earlier periods of intrauterine life, brings it into the position normal to the mature infant. The grounds on which such a question can be finally decided are not yet sufficiently known; but, so far as regards what has already been said, it is of little moment which explanation is the true one. But it is high time that the obsolete and misleading views regarding paralysis and contraction, so far as they refer to the ordinary typical conenital club-foot, were banished from our surgical lectures and ext-books.

Putting aside the question of tenotomy, which is simply an djunct to all methods of treatment, it may be correctly said that e cure can be obtained only by a gradual rectification of the osition of the limb. At that, accordingly, all proper methods im, and some attain it in one way, others in another, but all, ithout exception, have their weak points and drawbacks.

Well-constructed orthopædic apparatus is of very great value, nd can achieve signal triumphs in this disease. But it has its ark as well as its bright side. Its expense puts it beyond the each of the poorer classes and the poorer institutions to which hey bring their deformed children. Thousands of parents and undreds of charitable institutions cannot afford to procure the ecessary mechanism to apply to these distorted feet, not to nention replacing it by new apparatus as the child outgrows that riginally applied. Most of the untreated and uncured club-feet mong the poorer ranks owe their condition to the impossibility of rocuring the money required for the proper apparatus.

No treatment by bandaging to splints and afterwards using acing boots will bear comparison with that by apparatus. The foot, t is true, can be considerably improved, but the final results will ot for a moment bear comparison. Hence this plan of treatment s pursued, as a rule, only amongst the very poorest class of patients.

Rectification by elastic traction, as recommended by Barwell, loes not by any means excel the treatment by orthopædic apparatus, f it even comes up to it; and it is so closely allied to it, that it nay be said to be a mere modification of it with no special advantages to recommended it.

Gradual rectification by plaster of Paris bandages—a method we we to our German brethren—is, on the contrary, capable of simplifying and cheapening, to an important extent, the cure of the disease, nd putting a really reliable and satisfactory method within the reach of even the poorest. I have employed it for a considerable time, and have been led to make some modifications in the manner of employing it that seem to me to add greatly to its simplicity and success.

This paper, therefore, is designed to bring before the profession the mode of employing it which, I believe, amongst the poor at least, deserves to take the preference over all other methods of treatment.

In undertaking the cure of club-foot, it is absolutely necessary to be impressed with the fact that, although the position of the limb can be rectified to a great and satisfactory degree by a few months of treatment, there will in every case, or almost every case, remain traces of the disease, slight tendencies of the foot to assume its original perverse directions, which require for years, generally up to the age of puberty, a careful watching on the part of the parents, or an occasional visit to the surgeon who directs the treatment, and that these tendencies cannot be safely let out of sight until the advancing intelligence of the patient, and his increasing regard for his personal appearance render him fitted to watch himself over his faulty limb. It is of the utmost moment, and indeed the only way by which the confidence and co-operation of the parents of the patient can be secured and retained during the necessary series of years, that the amount of improvement to be obtained, the difficulties and disappointments to be overcome, and the tendencies to relapse that may be met with, be all carefully explained to them before the cure be undertaken at all. They ought to be invariably made acquainted with the difficulties of the undertaking they are entering upon, and should learn both its bright and its dark sides. It is necessary that it should be expressly, and with a considerable degree of formality said to them that the surgical part of the treatment may require a good many months, perhaps a couple of years; that after that is finished they themselves will have to be constantly on the watch for the reappearance of malpositions; that they must not be disappointed or discouraged should such occur, but have them promptly attended to; and that a tendency to inversion of the front part of the foot will never quite disappear until the child has arrived at the age of puberty.

Inasmuch as all structures of the foot are concerned in the production of club-foot, it stands to reason that the earlier the cure is undertaken after the birth of the child, the softer and less rigid will they be, and the easier will be the cure. But it is not wise to commence the cure in the first few months of life. The child at that epoch requires frequent bathing, has not acquired habits of cleanliness, and perhaps has a more vulnerable skin, so that it is not easy to keep the plaster appliances clean and dry. The best age to commence treatment is from six to nine months, at which time it will be found that the tissues are not appreciably more firm or resistant than at birth, while there is, on the other hand, the great advantage that by the time the foot is rectified the child will be beginning to walk, and the movements of standing and progression will materially aid in maintaining the improved position.

The treatment by plaster bandaging is exercised on the principle of putting the foot into as good a position as it can be made to assume, fixing it by plaster in that position till it has become natural to it; then taking off the plaster, rectifying the position still more, and again fixing it in the improved position, and so on until the foot is straight. The plan of treatment recommended in this paper has nothing new in principle, since it is merely a carrying out of this idea. But it is the way in which it is carried out that is claimed as being advantageous. It is usually recommended by those who employ the plaster treatment, to place the sole of the foot against a flat surface, press it as straight as possible, then apply the plaster bandages and allow them to set; or to pull the foot into as good a position as may be, and hold it firm until the bandages have been applied and become hard. Both these plans I have tried and given up as not sufficiently answering their intended purpose, and have adopted that which is now about to be described as better suited to effect what is desired.

Before entering on a minute description of the treatment which yields such good results, there are *three* preliminary subjects that require a short consideration.

In the *first* place, I would point out, that, even in an infant under chloroform, the clubbed-foot, when moved by the hand or other means into the best position it can be made to assume, resumes immediately on the removal of the force its original malposition, because the tissues spring back into the place that has become habitual to them. But it is possible, by a few minutes of firm manipulation, to tire out or exhaust the resiliency of the structures, so that the foot does not spring back—or rather has less tendency to spring back—but remains on the contrary in a considerably improved posture. For manipulating so as to effect this there is nothing equal to the hand of the surgeon, by which the amount of resistance, the point of resistance, and the direction of the resistance, can be so accurately gauged and overcome. If the clubbed-foot of a child under chloroform be grasped by the two hands of the operator and steadily and firmly unfolded, the projecting points which ought not to project (such as the calcaneo-cuboid joint) being firmly pushed inwards by the thumbs, and the toes and front part of the foot unfolded and coaxed outwards by the fingers, a certain improvement of the position is first obtained; then strong resistance is met with in the attempt at still further rectification, as the bones, ligaments, and fasciæ, all the firmer structures in fact, refuse further to give way. But if, disregarding their resistance, the force be continued, and even augmented, not by fits and starts, but steadily and inexorably, not with reckless force, but with a watchful yet determined persistence in the proper direction, the foot is brought into a position much more nearly normal than might have been considered possible; the bones, ligaments, and other resisting tissues, thanks to their yielding properties at so early an age, are moulded or forced into a comparatively normal situation without any signs of rending or fracture being observable, and their powers of resistance seemingly exhausted, remain in the new position with so little tendency to spring back, that the slightest support enables them to be kept there until the plaster bandages have been applied. Ten minutes steady moulding in this manner are more than sufficient in every case to obtain in a child of nine or twelve months of age a most pronounced and decided amelioration of the pre-existing deformities. It is scarcely needful to say, that the force must never be so wildly and recklessly applied as to produce fracture or dislocation, nor continued to too great an extent in the endeavour to obtain too much at one sitting, but that, a decided rectification once obtained, further attempts should be reserved for the next sitting. The merest minimum of practice is requisite to enable the surgeon to feel how much can safely be gained at each sitting.

This force, so applied, must evidently act by overstretching the soft parts, and probably by slight bending or even infraction (similar to greenstick fracture) of the bones, but it is never followed by any swelling, inflammation, extravasation, or other marked reaction, and does not pain the child after it has awakened from the anæsthesia. I may add that fracture or dislocation is very difficult to produce in so young a child, and need never be dreaded if even reasonable caution be preserved.

In the *second* place, I would add my testimony to the truth of that which has been already well and sufficiently pointed out by others, that the foot must be unfolded before the heel is brought down. It is not quite correct to say that club-foot is a combination of the equinus position, where the heel is drawn up, with the varus position, where the foot is inverted, and that the adjective equino-varus expresses the deformity. The deformity is far too complicated to be thus satisfactorily defined, for it affects even the knee-joint, appears markedly in the leg, and reaches in the foot such a degree of complicated twisting that no word or name can adequately express the state of affairs. Still, on the whole, so far as concerns the foot and ankle alone, the term "equino-varus" is *an approximation* to the truth, and, so far as the treatment goes, it is well to retain the term, helping as it does to indicate that there are two main sets of deformities to be overcome.

In the treatment, the foot must always be unfolded and the varus position rectified, before by the bringing down of the heel the equinus position is interfered with, for the fixation of the heel by the tendo Achillis is an immense assistance, giving an additional prop to work on in unfolding the anterior part of the foot.

In the *third* place, I would remark that division of anything save the tendo Achillis is rarely required. The fashion of promiscuous division of all the main tendons around the ankle cannot be too strongly condemned. It must be remembered that such tendons as possess synovial sheaths cannot be divided without the certainty, or next to certainty, that they will never reunite,—a fact often experimentally proved and never refuted, and that is yet not sufficiently appreciated or known. Although a foot may serve passably well for locomotion after division of a number of its tendons, that is no reason for running a muck against them, under the delusion that they are the offending agents in the disease. It is quite an erroneous and unjustifiable line of treatment to divide the peronei, the tibialis anticus, the tibialis posticus, or the flexor longus digitorum, each of which possesses a synovial sheath around its tendon. Their division is never necessary, is of no assistance in the treatment, and is merely

relic of the time, now gone by, when the pathology of the disase was thought to consist of paralysis of some muscles and conraction of others. In trying to cure the deformed foot it is quite mistake to divide tendons according to any fixed plan or rule; he only wise course is to wait until, during the progress of the oot towards rectification, it becomes evident that some structure is ffering a real and invincible resistance to the means employed, and hen of course that structure, whatever it be, must be divided. It vill invariably be found that in infants the tendo Achillis is the nly tendon requiring division, and that at the very utmost in ddition to this the plantar fascia may now and then have to be ut in the way recommended by Buchanan of Glasgow.

Having now exhausted the preliminary considerations necesary to prevent any misunderstanding, we come to describe the rocedure which it is my object to recommend.

The child, we will suppose, has arrived at about the age of six or ine months, and the parents have had clearly explained to them he possibilities and the difficulties of the case.

The child has all clothing removed from its lower limbs, and is laid upon a small table of the ordinary height, so that the operator can finish his work without the fatigue of prolonged and considerable stooping. A pillow is placed under its head, and chloroform is administered. Children bear chloroform well, and its administration is most desirable, as it renders the limbs passive and quiet during the rectification and bandaging. The chloroform need not be deeply given, but it must be administered sufficiently to prevent the child moving during the application of the bandages. The operator grasps, say, the right foot with both hands, back upwards, holding the ankle joint and heel in his left hand, and the front part of the foot in his right hand, with both thumbs pressing on the outer edge of the sole, opposite Chopart's articulation, just below the thin scar-like patch of skin usually present on the most prominent part of the dorsum of the foot. Maintaining steady pressure with his thumbs, he now strives by a deliberate, gradually and cautiously increased force, exerted by his hand, to abduct, evert, and pronate the foot, so as to bring it into as natural a position as possible, but without any attempt whatever to bring down the heel. At first the foot yields readily, but soon ceases to move as desired, and the operator becomes conscious that greater force will be needed to effect his object. Renewing his grasp, if this has been rendered insecure by the improved position of the foot and wrinkling of the loose skin on the outer part of the dorsum of the foot, he continues his task by applying, with the same steadiness and caution, an increased force, in exactly the same manner as before. The force is slowly increased, with every now and then, if there seems to be any danger of fracturing the bones, intermissions of half a minute or so, during which it is merely kept up, and not further increased, until the resistance of the foot being by degrees overcome, it unfolds from its perverse position, and has not the same strong tendency as formerly to spring back again. After as much advance has been made as seems prudent, the hands are removed, and the foot, if the manipulation has been well managed, lies passive and improved in posture, flaccid, and with considerably diminished tendency to return to its old vicious shape. There are no marks of its having suffered from the proceeding; there are no signs of fracture, contusion, or even abrasion, but the foot appears simply more normal in shape.

When this has been achieved the operator next proceeds to fix it with plaster of Paris in its new posture. It is bandaged from the roots of the toes to the insertion of the ligamentum patellæ with a single thickness of flannel bandage, one and a half inches in breadth and four feet long.

To retain the foot in the position most nearly approaching that of the normal foot, two strips of adhesive lead plaster are used, each of them eighteen inches long by one-third of an inch broad. One of these is made into a loop, applied to the foot over the ball of the great toe, and, guided by the hand of an assistant, pulls the foot outwards, or rather retains it by moderate traction in the favourable posture gained by the manipulation already described (see Figure 1). The second strip is likewise made into a loop, passed round the foot over the ankle and heel at the exact spot that seems most adantageous in each case, and forms a resisting force to the traction exercised by the former loop, by drawing the ankle inwards, or rather preventing its being drawn outwards. The assistant who holds these two stands on the right side of the pelvis of the patient with his face to the child's feet, and uses the toe strap with his right and the ankle strap with his left hand. In this manner he avoids interference with the operator, who now proceeds to put on the plaster bandages. A strip of "book muslin," one and three-quarter inches broad and five feet long, with plaster of Paris well rubbed into its meshes and loosely rolled up, is dipped for a few seconds into water until it is well soaked, then wrung firmly to expel the superfluous water, and wound round the foot and leg, beginning at the toes. It should not be drawn tight, but simply laid on outside the flannel bandage and loops of strapping where the latter are in contact with the limb, and it should be brought once or twice between the limbs of the straps where they leave the foot to proceed to the hands of the assistant holding them. The toes should be left uncovered. After the plaster bandage is in position, about a heaped breakfast-cupful of dry plaster of Paris is made into thin, nearly fluid, paste by adding the required quantity of water and stirring with a spoon, a common iron kitchen spoon serving this purpose best. With the spoon the paste is spread on the foot and leg, first along their upper surfaces, then along their sides, and finally

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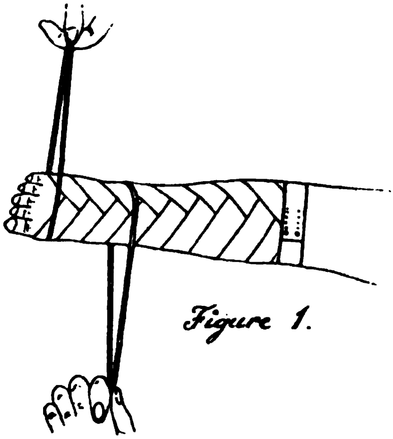

Figure 1.

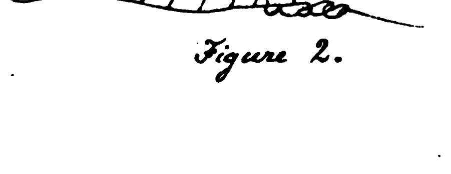

Figure 2.

Ogston on Club-foot

wn the back of the leg, over the heel, and on the sole to the ›ts of the toes, care being taken to insert a sufficient quantity tween the limbs of the two straps and carefully spread it out ɜre, so that the bandage may not be weak at these points. The ˂er of plaster thus applied to the foot and limb should be a arter of an inch thick, not exceeding three-eighths of an inch most. It need not be very carefully smoothed on its surface the spoon or hands of the operator; it is better to lay on outle it without any delay another muslin plaster bandage, which nders the exterior smooth and neat, and adds greatly to its rength and power of resisting injury. For this purpose, while e plaster is being laid on the limb with a spoon, another muslin ndage, similarly prepared to the first, should be soaking in ater, and as soon as the plaster is spread on the limb, and while is yet soft, the second bandage is wrung out and laid on outside le plaster layer in the same manner as the former one had been pplied, with the same care to bring it once or twice between the mbs of the loops of strapping. When this last bandage has been ut on, any plaster paste remaining over may be used to rub on s exterior and make everything smooth and neat. By the time ll this has been done the plaster will have begun to set, and as on as it is firm enough not to yield or crack when the straps are elaxed, these should have their ends cut off close to the plaster, nd the places where they have emerged be smoothed over with a ouch of the plaster paste.

The limb is now finished, the toes alone remaining uncovered, o that they may show by their temperature and colour whether he bandage has been by accident too tightly applied around the imb. If reasonable care is taken not to pull the inner muslin andage too tight, this occurrence never happens, and the toes emain pink and warm. Should they be slightly bluish and cold, he bandage may still be left on, as that is a condition that will in ll probability pass off in a few hours and cause neither pain nor trouble. But if they be found deep purple and quite cold, the bandage is certainly very badly applied, and must come off at once. I have never once, however, seen a bandage require to be removed for this or any other similar cause.

The other foot, the left one in the case we have supposed, is next treated in a precisely similar manner, the hands of the operator who manipulates and of the assistant who holds the straps, being of course reversed, and the straps being also reversed, as is self-evidently necessary.

The whole of the above treatment can be readily carried out in half an hour, or, with a little practice, in even less time. The chloroform is stopped, and the child, when it awakes, shows signs of neither pain nor uneasiness, so soothing is the firm, equable support of the plaster of Paris bandage. I have never seen the treatment followed by more than a very slight uneasiness of the child for the first twenty-four hours, and that was probably to the effects of the chloroform, or to the feeling of weight of t bandages.

The plaster bandages, if well applied, will easily last for s weeks, and for that period they should be left undisturbed. far as I have been able to judge, no advantage is to be gained renewing them at shorter intervals. The foot requires some t to become habituated to its rectified position, and, active as t processes of life and repair are in infants, they seem to ne period of about this duration to make the new position normal a habitual to the foot. The parents are therefore instructed remove the plaster bandages two days before the expiry of t six weeks. They are best removed by cutting or scraping th through with a stout knife, and as their removal requires a g deal of time and trouble, it is best that the parents be instru to undertake it themselves. The limb ought then to be w washed to remove the rough epidermis that has collected on t skin, and, when seen on the expiry of the six weeks, the foot, hav been free for two days, shows by the position it has assumed degree of improvement really attained by the treatment. A slight abrasions, not amounting to complete removal of the ep dermis, are generally seen in the form of red lines about the ank These offer no contra-indication to a renewal of the treatment. T child is again anæsthetised, and, by the same manipulation an bandages, the foot is still further rectified. Every six week fresh rectification is obtained until the foot has lost all tenden to adduction and inversion, and even become somewhat abduc at Chopart's joint.

It is absolutely necessary not to begin to bring down the he *i.e.*, cure the equinus position, until the varus position has completely gone, and even been replaced, as stated above, by a sli abduction. For the foot will in time again become a lit abducted, hence the wisdom of curing the varus deformity a fundamentally as possible. In slighter cases three or four banda ings suffice to effect this; in the worst cases six or eight may required.

Once the varus position has disappeared the tendo Achillis m be cut. It is no use trying to avoid its division. The heel w not come down without it. It is indeed easy by the plaster treatment to produce dorsal flexion of the foot and bring the to up, but this is effected by a yielding of Chopart's joint, the he remaining unchanged in position, and the sole becoming conve instead of concave. Hence, in commencing the second part of th treatment, the cure of the equinus position, it is wise, at the ver outset, to divide the tendo Achillis. On the subcutaneous divisio of this structure I have nothing special to say, save in favour effecting reposition of the foot immediately after it, as saving ti and being unattended with any disadvantage.

Accordingly, in undertaking the second part of the cure of club-oot, the correction of the equinus position, the first act is to perorm, under chloroform, tenotomy of the tendo Achillis in the sual way, then after having washed the leg with carbolic water, o apply a pad of antiseptic gauze over the small wound, and etain it there with the hand during the manipulations that immediately follow. There is no harm whatever in rectifying the lantar flexion of the foot at the ankle-joint to a considerable xtent immediately the tendon is cut, and the operator should herefore proceed at once with the following manœuvre. In the ase of the right foot the leg is grasped just below its middle by he surgeon's left hand, back upwards, the fingers of this hand etaining the gauze pad in position over the tenotomy wound. The palm of the right hand is placed against the sole of the foot, he fingers and thumb closing on its dorsal surface, and the toes re steadily raised, so as to produce dorsal flexion of the foot, until he resisting structures are tired out and yield, just as in the forcible rectification of the varus posture. It is well, however, not to press matters too far in the sitting of which the tenotomy forms the commencement, but to wait for next sitting to wield the manipulation with its full power. After reasonable rectification has been obtained, a flannel bandage is applied as before, and serves to retain the gauze pad over the tenotomy wound, and the limb is fixed in the improved posture so that the plaster may be put on. This is done as follows:—

An assistant, standing on the right side of the child, obtains complete command over its knee-joint by placing the palm of his right hand on its outer side, and grasping the articulation with his thumb closed over the patella, and the fingers crossing behind over the popliteal space, and resting on the head of the tibia behind so as to push it forwards, thus keeping the extremity firmly extended at the knee-joint. Only a single loop of plaster is thus required, and is crossed over the sole of the foot just at the balls of the toes, while its ends, meeting together above the dorsum of the foot, are held in the assistant's left hand, and serve to draw the toes and front part of the foot upwards, and fix them in the desired position (see Fig. 2). The plaster of Paris bandages and paste are now put on exactly as before, and the limbs of the plaster loop cut off. The opposite limb is then submitted to the same treatment. When six weeks have elapsed the bandage is removed, the foot is further rectified, a new bandage is put on, and the process is repeated until a good form and position have been acquired by the foot, a thing generally obtainable by at most three or four repetitions of the proceeding. It is then put into a lacing boot and the child is allowed to walk.

Even then, however, it is well to be suspicious of a club-foot, and emphatically to repeat to the parents before dismissing them that tendencies towards relapse are far from improbable, especially in the direction of adduction of the front part of the foot Chopart's joint. It has been recommended to advise the mot of every child whose treatment for club-foot has been finished, t sit down with the child once every day and carefully flex the fro part of the foot upwards on the leg, following this by a firm a decided adduction of the foot at Chopart's joint, so as to aid i keeping the heel down and the toes outwards. This apparentl sensible advice I have never found to be productive of any benef since few, if any, mothers will use sufficient force to render th proceeding of any real avail. But it should be well impressed o those who have the charge of the children, that they should retu to the surgeon on any serious symptoms of relapse setting in. I a relapse occur, it must be treated in the way already detaile according as it is the varus or equinus position which is returnin If varus, the manipulations and bandages for that; if equinus, a repetition, if required, of the tenotomy of the tendo Achillis followed immediately by the manipulations and bandaging fo that. But if the cure have been thoroughly completed in the firs instance, and no gross error in the management of the child have been subsequently committed by the parents, a relapse is not t be expected.

This concludes the description of the cheap and simple treatmen which I would recommend in club-foot. It is, as already stated not new, for plaster of Paris is used by many on a similar pla and with success. But the manipulative straightening of the foo which I was led to devise while trying the ordinary plans is o great assistance in shortening the treatment and making it mor exact and satisfactory. When mentioning above the number o times the bandages have to be renewed, the maximum number that has hitherto been found needful in the worst cases has been stated, but, generally speaking, fewer are required.

Nor is this method claimed as being without defects. At present we know of no method free from defects, but that which is here recommended is as free from them as any I know, and is the only one which seems to me able to compete with the treatment by orthopædic apparatus. Moreover, I believe I am speaking within the mark in saying, that the results obtained by it are in no way inferior to those obtained by apparatus in point either of completeness of rectification or of the time required to effect it.

Simple and effectual as it is, it deserves a trial in the hands of those who have to treat clubbed-feet amongst the poorer classes.

TICLE II.—*Case of Idiopathic Anæmia.* By JOHN HADDON, M.A., M.D., Manchester.

MES S., æt. 38. *Previous History.*—When a lad, and up to the e of 20 years, he had not enough to eat, owing to the poverty of s parents. He first worked in a cotton-mill, after which he tried work on the roads, but found it too hard for him. He then came a chapel-keeper and sexton. At the age of 28 he went to a coal-yard, where his work was principally in the open air. t the age of 29 he married, and has one child. Five years ago had inflammation of the lungs, and was seven weeks away from s work. During the height of the illness the expectoration had pink colour. He has not felt in the same robust health since at illness. About the beginning of 1876 he began to look after e books at the yard where he worked, and while so doing he sat a wooden cabin about two yards square, which was heated by a tove. He used to sit shut up in the cabin, which was without ny means of proper ventilation, and latterly the stove did not ork well, and so vitiated the atmosphere. In January 1876 he ad an attack which I thought at the time was an ordinary febriula. He was in bed about a couple of days. There was nothing o be noted about him then, except that he had a systolic murmur t the base of the heart, but he did not complain of any inconvenience that could arise from it.

During the summer of 1877 he was low-spirited, and had no heart for anything, but after a holiday in Wales he was better. About Christmas 1877 he became low-spirited again, and would sit a couple of hours thinking, without speaking a word to his wife, unless spoken to. About the same time he began to complain of shortness of breath on making any exertion, and a weakness about the knees.

His food after his marriage consisted of the following:—Bread and milk so soon as he got up, and about an hour afterwards, coffee, bread, and bacon. He took his dinner to his work with him. It consisted of potato-pie, *i.e.*, meat and potatoes, or two eggs, with bread and coffee. When he got home at night he had meat, potatoes, and cabbage.

He came to me on 1st May 1878, complaining of shortness of breath when walking. He was about 5 feet 11 inches in height, with abundance of almost black hair both on face and head. He was in no way emaciated, but had a puffiness about the face without œdema. He had a sallow complexion, but the conjunctivæ were quite white, and without any tinge of yellow. His tongue was clean. He had no teeth to chew with, only a few stumps being left, and his mouth had been in the same state for many years. His bowels were regular, and there was no albumen in his urine. The respiratory sounds were normal There was a systolic bruit heard over the cardiac region. The pulse was regular. He could not walk to and from his work owing to breathlessness, but when he was sitting he felt well enough. On pricking his finger the blood was seen to be watery-looking, and ran over the skin. The red corpuscles were markedly reduced in number, and they did not form such perfect rouleaux as those of healthy blood. There was a decided increase of white corpuscles, which were about the same size as the red ones. There was besides a sort of granular débris, as if from the disintegration of the corpuscles. No other cells were detected.

Having read of Dr Bramwell's success with arsenic in cases of idiopathic anæmia, I gave him three-drop doses of liquor arsenicalis in tinct. ferri perchloridi, and increased the arsenic until he was taking seven drops three times a day in the beginning of June. He had improved at walking, and I considered him much better, when he was advised by some friends to take advantage of the hospital at Southport. He went there about 6th June, and during the first week could walk three or four miles without difficulty. He took quinine and iron while at the hospital, but he began to get worse, and was brought home on 1st July in a very weak state. On returning home his club doctor attended him. He gradually became weaker, and died on 15th July.

His wife informed me that during the week before his death he occasionally said things which made her think he was not quite himself, but he was quite conscious, and spoke as sensibly as ever he did, the night before his death. He had attacks of breathlessness which were very distressing, and during these attacks he complained of pain over the cardiac region. He became unconscious at 3 A.M., and died at 5 A.M. on 15th July 1878.

Remarks.—Such cases of anæmia cannot be common in this district, as it is the only one I have seen during ten years' practice, and as it may not be my lot to see another, I desire to add it to the list of cases already published, hoping that it may be of some use to those who are studying this class of cases, the pathology of which is obscure, and the treatment unsatisfactory. Pathologically the case is of no use. Therapeutically it is interesting, seeing that improvement took place while arsenic was being taken. Etiologically it is valuable, and the chief points to be noted are—*First*, The insufficient diet in his youth; *secondly*, The full diet after his marriage; *thirdly*, The inflammation of the lungs five years before his death, after which attack he never felt so well as he had done before; and *lastly*, The character of his occupation during the last two years of his life, in a small cabin without ventilation, in which was a leaking stove.

ARTICLE III.—*Cases of Amenorrhœa.*

By Dr G. de GORREQUER GRIFFITH, Senior Physician to the Hospital for Women and Children, Consulting Physician-Accoucheur to St Saviour's Maternity.

THE following cases are not devoid of interest:—

Miss H., an Irish lady, came to consult me about the suppression f the menses. She is in height above the average; is of large build, hough not by any means of a masculine development; the complexion is dark; the hair is dark brown; the eyes are of the same hue; the cheeks are full, plump, and with a delicate blush upon hem; the lips are likewise full and of the same delicate tint; the eeth are white and good, showing no natural constitutional weakness; the chest is well proportioned and the breasts well deveoped; the hips are in keeping with the dimensions of the frame; altogether the body is well set, and well clothed everywhere with fat, so that there is no evidence of want of condition.

History.—All her family are healthy and very strong, and she herself has ever enjoyed the best health, nor can she recollect any illness happening to her until the present ailment occurred. She always had a ruddy colour in her cheeks, and it is only since this illness that she has lost it, and that the tint of delicacy has made its appearance. About four months ago she was unwell, and while in this state was greatly frightened, so much so indeed, that "she felt a shock all over her, as if she had been electrified, and was conscious of a great change in her system." The menses seemed to be immediately checked, to be dried up at once. She was completely paralyzed with fear and utterly prostrated. Not wishing to consult a medical man, she allowed this condition of things to continue for some weeks, hoping that the menses would daily return, or, at worst, be deferred only till her next period, and that with their re-appearance she would regain her health. The monthly period came round, and though she felt bodily very ill, there was no "show." She had already begun to suffer pain in the head and eyes, and a sense of fulness, neuralgia of the face, chest, and limbs, pain and weakness in the back and loins, weariness and lassitude, petulancy of temper, peevishness and fretfulness, which she could not subdue. At the time of the next monthly period there was no appearance of the catamenia, and the only difference that obtained in the symptoms of her illness was an increase in their intensity. She missed four periods. After the fourth had passed without a return to her natural health, she consulted me. She was ordered a warm hip-bath every second night, mustard poultices to the hypogastric region and to the inside of the thighs; the bowels were well opened by means of the sulphate of magnesia; the breasts were well rubbed three times daily by a nurse; she was made to take as much exercise as she could in the open air, but not so much as to fatigue her; and every kind of nutriment, in quantities that the stomach would bear, were allowed her. Besides this she was put upon the ethereal tincture of ergot, and galvanized every night or every other night. The manner in which I applied the galvanism was the following:—

The poles were placed as nearly as possible at points corresponding to the sides of the womb—by "sides" I mean the outer edges; and after the electricity had been conveyed for some minutes in a continuous current, the plan of its administration was altered, and it was given in shock currents. The position of the poles was changed; one was placed over the right and the other over the left ovary, the continuous and shock currents being both employed in the manner that I have just described. I now had one pole put by the attendant on the breast as near to the nipple as I could, without being actually upon it, and the other upon the opposite ovary: then the poles were placed, one on the right breast, and the other on the ovary of the same side, and the electricity used as before mentioned; again, the poles were shifted, and one was put upon the left breast, while the other was pressed against the integument of the abdomen, immediately over the situation of the left ovary. This latter application of the galvanism could not be tolerated, because of the "cramping sensation in the heart," and because of the distress occasioned her by it. The upper pole was, therefore, removed to the right breast, and the currents, both the continuous and the shock, were given in a cross manner,—that is, the right breast and the left ovary were the parts through which the electricity was conveyed into the system.

As the ergot did not seem to act in any other way than in griping her, and in making her feel intoxicated, it was laid aside, and the oil of savin substituted in ten-drop doses, three times daily. Moreover, on the third morning before the day she ought to become unwell, I gave her a draught containing fifteen minims of the oil: on the morning following she had thirty minims, and on the day that she expected the catamenia to return, I had the satisfaction of hearing that a white discharge had made its appearance. This discharge I looked upon as vicarious.

The effect of the treatment was as we desired. It occasioned pains in the ovaries and in the womb; also in the latter it created a bearing-down sensation, as though the patient wanted to pass something, and could not.

The savin did not occasion sickness, as I ordered it to be taken immediately after meals. The only source of discomfort she experienced was the return of the taste of the oil into her mouth.

The electricity had been discontinued for three or four days before the day the menses were expected to return, and both it and the oil were left off when that day had passed, in order to enable the patient to have a rest from all treatment, and that, when it was again begun, there might be the more signal effect.

Three weeks before the next period the oil and electricity were

gun. The latter, as on the previous occasion, was laid aside a r days before the menstrual function was expected to resume its ivity, as the patient thought it drove away the pains which she nsidered peculiar to her being unwell, and from which she now, in the last month, began to suffer.

She felt assured that at the ensuing period she should see the tural discharge; and at this conclusion she arrived because of e sensations which she experienced. The period occurred, and e came to me to tell me that the menses had begun to flow, nd that the distress, mental and physical, was removed.

The second case which I shall mention is that of Miss V., aged 7. For some time she had been, she states, in delicate health, nd had been losing flesh. She is of spare habit, but she was ome little time since in plump and good condition; the face is ale, thin, and the features are drawn and pinched; the entire of he body is wasted, and its surface pale and unhealthy looking. he bowels are generally constipated, and require medicine to nove them.

Suspecting habits of delection, I inquired if she suffered from rritation, and learned she did so, and that to procure herself ease she had recourse to rubbing the parts where the irritation existed.

In tracing the history of her present affection, I gained from her the information, that about six months previously, whilst she was unwell, she got a fright and damp feet; that the menstrual flow was at once arrested and had not since returned, and that from the time of such occurrence she had grown thinner each day, had lost all inclination for food and for society, had been attacked with the violent irritation referred to, and had fallen into the bad state of health which now obtained.

The first indication of treatment was to procure a free evacuation of the fæces, and this was done by means of the sulphate of magnesia. Afterwards the remedial measures were the same as in the case of the first patient quoted. On the morning of the day upon which the menses were looked for, there was a bleeding of the nose, and in the course of the day the catamenial discharge made its appearance. It, however, again on the same day disappeared; on the following morning the epistaxis returned, and with it also the menstrual flow. Since then the patient did well and has been restored to health.

I could recount many other similar cases, but for practical purposes I consider two typical ones sufficient.

The points of interest to which I would draw particular attention are,—1*st*, The general conditions of the two patients—almost diametric; 2*d*, The similarity of treatment; 3*d*, The successfulness of it, though in general conditions the patients were so dissimilar; 4*th*, The method of applying the electric current, and the effect through the mammary and generative systems aided by the medicinal treatment employed.

ARTICLE IV.—*Cases of Intra-Cranial Tumour.* By Byrom Bramwell, M.D., Physician and Pathologist to the Newcastle-on-Tyne Infirmary, Joint Lecturer on Clinical Medicine and Pathology in the University of Durham College of Medicine, Newcastle-on-Tyne.

(*Continued from p.* 315.)

The last case which I related was a good example of the pseudo-apoplectic attacks which occur during the course of intra-cranial syphilis; the next is another illustration of the same condition, and is interesting from the fact that motor power was regained before sensibility.

CASE V.—*Left Hemiplegia: Optic Atrophy: Syphilitic Choroiditis: Dementia: Motor Power regained before Sensibility. General Convulsion. Coma. Death. Syphilitic Tumour pressing upon the Right Parietal Convolution and causing Extensive Softening.*

R. S., æt. 41, chemist, single, was admitted to the Newcastle-on-Tyne Infirmary under my care on 12th November 1874, suffering from left hemiplegia.

Previous History.—The patient has led a dissipated life, being both a spirit and opium drinker, and has had syphilis. (The exact date of the primary affection could not be ascertained.) His present illness commenced about a year ago with severe headache and rheumatism. Three months ago he awoke one morning to find that he had completely lost the use of his left arm and leg. For some weeks after the attack he was confined to bed, but of late he has been gradually regaining motor power, and is now able to walk with the aid of a stick. He has never, so far as he knows, had a fit. For some time past his eyesight has been failing.

Present Condition.—He looks much older than his years, his hair being quite grey. He is, however, fat and jovial; his appetite is voracious. His mental powers are very much impaired, memory in particular being very defective.

Motor Power in the left arm and left leg is considerably impaired, and there is complete loss of sensibility in the same parts.

The optic discs are in an advanced stage of atrophy, and the results of extensive (syphilitic) choroiditis are seen in both eyes. There are some characteristic nodes on both tibiæ.

The urine is loaded with phosphates, and is often passed in bed. The other organs are natural.

Progress of the Case.—There was considerable improvement under full doses of iodide of potassium; motor power continued to be regained, and sensibility was partly restored.

On 5th, 6th, and 7th December he suffered from severe headache.

On 8th December he was seized with a severe general convulion, followed by profound coma, and death in twelve hours.

The Autopsy was made eighteen hours after death. The skull-ap was natural. The dura mater was firmly adherent along the ine of the vertex, and was considerably thickened over the osterior part of the right hemisphere. A nodulated mass, the ize of a large walnut, and consisting of several distinct tumours, prang from the dura, and pressed upon the right hemisphere in he neighbourhood of the upper parietal convolution. The cerebral ubstance surrounding the tumour was almost diffluent; the oftening extended throughout the whole of the upper and middle arietal and the upper occipital convolutions, and involved a large ract of the subjacent white matter (see Plate I. Fig. 3, page 141 of his *Journal*).

The other parts of the brain, notably the corpora striata, were ealthy. The membranes were in places somewhat thickened and paque. There were no signs of hæmorrhage, either old or recent. The condition of the vessels is not noted in the post-mortem record.

The tumour was of firm consistency, in some parts almost cartilaginous. On section it was in places of a yellowish green colour. Thin sections presented at first sight a uniform granular appearance, but on more careful examination, especially after teasing, were found to consist of small round and angular cells, many of them in a state of fatty degeneration. In some parts of the tumour a few delicate fibres were seen.[1]

There were two cicatrices on the upper surface of the liver. The other organs were loaded with fat, but otherwise healthy.

Remarks.—Clinically this case is chiefly interesting in a diagnostic point of view, for it illustrates the fact that hemiplegia, the result of cerebral softening, may occur suddenly, resembling in its onset an attack of sanguineous apoplexy; indeed, such was the opinion I formed (hemiplegia from cerebral hæmorrhage) when the patient first came under observation, my diagnosis being based upon the history of the attack (the paralysis occurred suddenly during the night), and the fact that the paralysis was evidently organic, *i.e.*, due to a destroying lesion, and not functional (post epileptic). On further examination, however, and after having obtained from my brother, Dr J. W. Bramwell, a more accurate account of the previous symptoms, it was evident that the case was not so simple as it at first appeared. The repeated attacks of severe headache, the fact that the patient was manifestly syphilitic, the optic atrophy, and the abundant phosphaturea, suggested the presence of some gross syphilitic lesion, but did not, of course, invalidate the diagnosis of cerebral hæmorrhage,—in fact rather the contrary, since hæmorrhage in the neighbourhood of a tumour, *i.e.*, in the softened brain tissue around the tumour, is by no means uncommon. The termination of the case, too,—severe general convulsions, followed by profound coma and death,—exactly resembled the effects of a large hæmorrhage.

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[1] Some doubt having been expressed at the meeting of the Medico-Chirurgical Society as to the nature of the tumour, I sent a small portion of it to my friend Dr D. J. Hamilton, who very kindly examined it and reported as follows: "About the other tumour, what I have seen of it in the small piece you sent me would lead me to suppose that it was not properly a syphilitic gumma. It consists in great part of the structure of a gumma, namely, caseating inflammatory products; but one thing which would lead me to suppose that it was non-specific, is that there is none of the obliterative affection of the small arteries which one so often almost constantly meets in specific gummata. It is quite possible, however, that the arteries at some other part were thickened in this way. Were such a state of the vessels present, I should say without hesitation that it was a gumma."

The lesion was an extensive one, the parts of the brain immediately invaded were the upper and middle parietal and the upper occipital convolutions (see Fig. 3, Plate 1, page 141), the subjacent white matter was largely destroyed, but the exact extent of this destruction I am unable to define; the post-mortem record is silent on the point, and I dare not at this distant period trust my memory to fill in details. The omission is unfortunate, and destroys the value of the case in a localizing point of view. One very interesting point is the fact that motor power was regained before sensibility. Ferrier places the tactile centre in the hippocampal region,[1] and says clinical observers "have demonstrated that rupture or disorganization of that part of the internal capsule, or peduncular expansion of the crus cerebri which lies external to the optic thalamus, causes hemianæsthesia of the opposite side of the body."[2] It is probable, therefore, that the lesion extended deeply inwards towards the great ganglia, and if so it is easy to suppose that some of the motor fibres going to the corpus striatum, which was itself healthy, may have become involved. In this way the motor paralysis would be satisfactorily accounted for.

Nature of the Tumour.—Notwithstanding the fact that no obliterative affection of the arteries was found by Dr Hamilton, I am still firmly of opinion that the new growth was syphilitic, for, firstly, the patient was manifestly syphilitic, as proved by the tibial nodes, the extensive choroiditis, and the cicatrices on the liver; and, secondly, the tumour, both in its naked eye and microscopical appearances, exactly resembled the hard syphilitic gumma so well described by Heubner[3] in the following words:—"The new growth appears (second) as a yellow, firmer—often as firm as cartilage—dry, friable substance, upon section homogeneous and cheesy, which is found either in the form of somewhat sharply circumscribed larger or smaller tumours, or invading the grayish-red substance just described . . . . We find them (the yellow masses in the form of completely circumscribed, often almost encapsuled umours (like cerebral tubercles), around which remains of chronic nflammation, or gray-red new formation may be found. They are s large as an almond or dove's egg, and, in the first place, several ften lie together . . . . Upon microscopic examination, it seems that his homogeneous mass consists of a granular substance, entirely uniform upon their sections, apparently without further structure, and completely devoid of vessels. When broken up or torn apart, however, it sets free for the first time a multitude of angular or roundish granular elements, which resemble shrivelled or broken cells of roundish shape, and may correspond very well to the remains of the round cells which form the grayish-red syphiloma. Of the other elements, connective tissue fibres, spindle cells, etc., nothing more is to be seen . . . . This neoplasm has two favourite seats—the dura mater and the subarachnoid space."

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[1] *The Functions of the Brain*, p. 175. [2] *Ibid.*, pp. 181, 182.

[3] Heubner's "Syphilis of the Brain and Nervous System," *Ziemssen's Cyclopædia*, vol. xii. pp. 303, 305, 306.

The dementia in this case was considerable, and bears out Dr Hughlings-Jackson's views as to the functions of the posterior lobe of the right hemisphere.

Dementia to a less degree occurred in the next case which I shall report, and was associated with the presence of a tumour in the fore part of the right frontal lobe. In that case a condition of temporary mania, a symptom of very rare occurrence in cerebral tumours, was observed.

I have no note as to whether the voracious appetite was an early or a late symptom—in all probability it was due to the dementia, and was in no way characteristic of the tumour. I shall afterwards relate a case in which the same symptoms (voracious appetite) occurred early. That is, however, the only case in which I have been able to confirm the observations of Drs Lawson and Bevan Lewis on this point.[1]

CASE VI.—*Injury to Head: Change in mental disposition: Headache: Vomiting: Convulsions: Optic Neuritis: Paresis of left arm and leg: Sudden attacks of loss of power in both arms and legs, the loss of power being much greater in the left than in the right: Mania: Imbecility: Coma: Death. Interior of Skull-cap studded with minute Spiculæ; Tumour in the middle of the right frontal lobe involving the superior frontal convolution.*

D. M., æt. 40, married, formerly a sailor, but lately a pitman, was admitted to the Newcastle-on-Tyne Infirmary on 22d March 1875, complaining of headache, fits, and loss of power in the left arm and leg.

Previous History.—He was an extremely healthy man until a year ago, when a large piece of coal fell upon his head, injuring him severely. He was laid up for a fortnight, and has never been well since. His mental disposition has quite altered. Instead of being quiet and good tempered, he has become irritable and passionate. His wife thinks his illness is partly due to mental anxiety (He "got wrong" with a neighbour's wife; the husband was so distressed that he killed himself.) He has suffered from intense headache, and has had several severe epileptic fits. For twenty years he has been a hard drinker, but has not had syphilis.

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[1] West Riding Hospital Reports, vol. vi. p. 125.

State on Admission.—He is an unusually strong muscular man. His expression is silly, and he frequently bursts into a meaningless laugh. He answers questions readily, but his statements cannot be depended upon. Some days he is much more stupid than others. He sleeps well, dreams frequently, and often grinds his teeth.

Two inches above and slightly behind the right ear there is a cicatrix, the result of the injury mentioned above.

The headache is at times agonizing; it is generally frontal, and is not worse at night. Stooping causes him to feel giddy and increases the headache.

The right eye is blind from an old injury, but he sees well with the left. The pupils are equal, and moderately dilated. The left disc is markedly œdematous, the veins large and tortuous; the right fundus shows extensive results of the former injury—atrophy of the choroid, with large deposits of pigment and atrophy of the disc.

Hearing, *taste*, and *smell* are natural.

He often falls to the ground in consequence of sudden loss of power in the muscles of the left side of the body. In these attacks there is no apparent loss of consciousness, and no convulsive twitchings. There is decided loss of power in the left arm and leg; the motor power in the right arm, right leg, and in both sides of the face, is also somewhat impaired. The muscles on both sides of the body are extremely well developed. He walks without any help, but the gait is peculiar—he takes a few quick steps to the left, and then a few quick steps to the right, often breaking into a short run. There is no muscular tremor.

Co-ordination, *sensibility*, and *speech* are natural.

Reflex action is more marked in the right than in the left leg. The *bowels* are costive. He often vomits. The vomiting is evidently cerebral, the tongue being quite clean, and the digestive organs normal. It generally occurs first thing in the morning on getting out of bed.

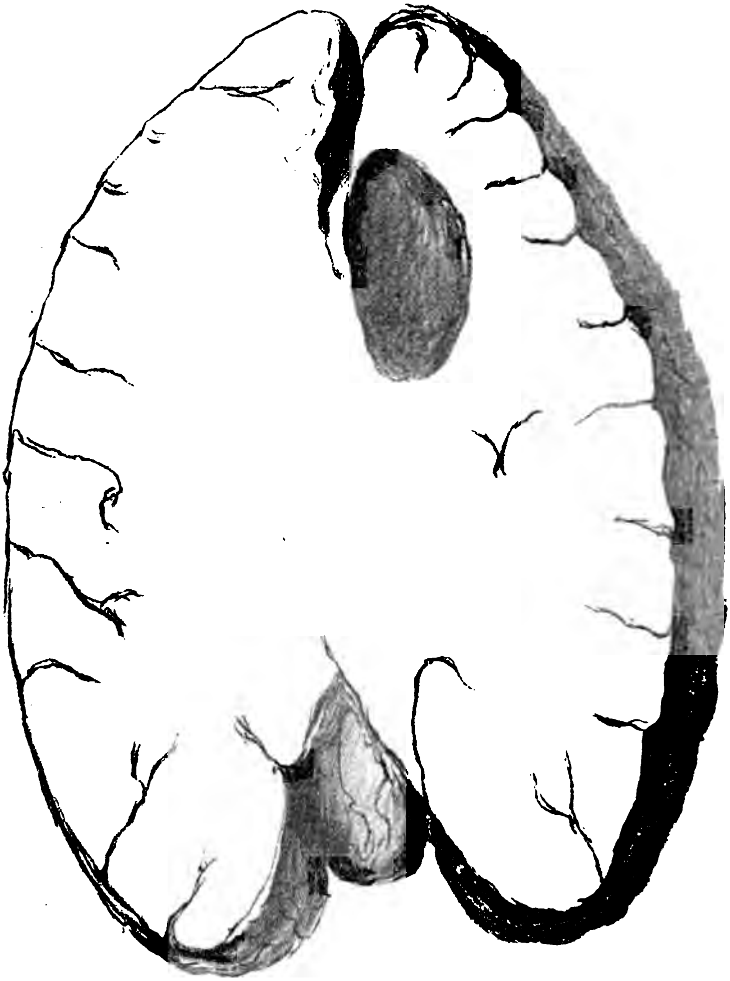
The urine is loaded with phosphates.

Treatment.—Iodide of potassium, bromide of potassium, mercury, ergot of rye, cold to the head, and counter irritation to the back of the neck, were all tried, but without benefit, as is seen in the following notes:—

6*th April.*—He has been very much worse for the past few days; the headache is intense; he looks stupid; the face is deeply congested. For some days the pupils have been widely dilated.

10*th May.*—The paresis is so much worse that he is unable to get out of bed without assistance.

PLATE II.



Brain of D. M. above the corpus callosum, showing position and extent of the lesion.

14th May.—The muscular weakness has all gone, and there is a marked alteration in his mental state. He is suspicious of everything and everybody; says his wife has been unfaithful to him; will take neither food nor medicine, thinking everything is poisoned; wanders about the ward trying to escape, and says he will do for himself and others if he does not get out. His expression is wild and haggard; the conjunctivæ are deeply congested.

15th May.—He was "quite wild" last night, and was to-day sent to the Asylum.

A few days after his admission the excitement passed off, and he relapsed into his former quiet, silly state. On 18th September 1875 he became comatose, and died on 20th September.

Through the kindness of my friend Dr Wickham I visited him twice, and was present at the post-mortem, which was made twenty-four hours after death.

Autopsy.—The face was pale, the pupils equal, and of moderate size. The scalp was adherent to the bone at the seat of the cicatrix, the position of which I have described above. The exterior of the skull-cap was normal. On removing the calvarium many minute sharp projections were found springing from the inner table. These little spiculæ were pretty equally distributed over both frontal and both parietal bones. The pacchionian bodies were particularly large; several of them projected through the dura mater, and one at the tip of the right frontal lobe had made a considerable excavation in the frontal bone. The dura over both hemispheres was thickened. The vessels on the surface of the brain were gorged with blood. The arachnoid and pia mater were here and there thickened and adherent, these appearances being best marked over the right frontal lobe. The membranes at the base were normal. The convolutions were greatly flattened, and the sulci effaced. The ventricles were considerably dilated. The upper right frontal convolution was softened and gelatinous, and of a pinkish colour. The subjacent white matter in the middle of the right frontal lobe was similarly affected. (See Plate II.)

The other parts of the brain were normal. The vessels were natural, and there was no embolism. The contents of the encephalon weighed 59 ounces; brain, 50½ ounces; cerebellum, 8½ ounces.

The other organs were particularly healthy.

The degenerated portion of brain was placed in Müller's fluid, and forwarded to Dr Herbert Major. It unfortunately did not harden sufficiently to permit of section. From its recent appearance I am inclined to think it was a glioma.

Remarks.—The mental condition of this patient, until the attack of mania, exactly resembled the mental condition of a man who was admitted under my care on 1st October 1874, suffering from an intra-thoracic tumour. In that case[1] a large cyst was found after death in the left frontal lobe. The position of the lesion in the two cases was identically the same, the one being in the right, the other in the left hemisphere. In both cases the superior or first frontal convolution was invaded, and yet there was nothing abnormal in the condition of the eyes, nor was there any apparent loss of extension of the opposite arm and hand—a point of some importance, since Ferrier places the centres for these movements (5) and [illegible] in this region. It is perhaps worthy of remark, that in the case in which the lesion was on the left side, there was a decided aphasia, whereas in the case of D. M., speech was unaffected.

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[1] See *British Medical Journal*, 3d March 1876.

Another point of interest is the fact, that in both cases the motor power in the side opposite the lesion was frequently suddenly lost, and quickly regained, these temporary attacks of hemiplegia not being preceded by any convulsion. In the case of D. M. the attacks of left hemiplegia were associated with decided paresis of the right arm and leg, *i.e.*, the arm and leg on the *same* side as the lesion,—a fact which seems to support Dr Hughlings-Jackson's theory, that an epileptic discharge of one hemisphere may give rise to convulsions of *both* sides of the body, the spasm travelling to the second side by the route of the direct fibres, and not through a secondary affection of the other cerebral hemisphere, pons, or medulla. Dr Hughlings-Jackson has not demonstrated the occurrence of any paresis on the second side, but he supports his proposition by the fact that two sets of wasted fibres "descend" into different columns of the cord; into the lateral column of the opposite side (first side); and into the anterior column of the same side (second side); the wasting of the lateral column affecting that part of it where there are most fibres of smallest diameter, the part of the anterior column being that where there are the thickest fibres of that column—the largest of all the cord.[1]

The peculiar spiculated condition of the inner table of the skull which was present in this case, is a pathological condition which I have not before met with.

Another pathological point was the great weight of the brain—59 ounces. Turner[2] gives the weight of the adult human brain as 49 to 50 ounces. In this case the cerebellum weighed 8½ ounces. Its proportionate weight, therefore, to the contents of the encephalon was considerably above the average, which, according to Quain and Sharpey, is as 1 to 8.

The head injury was in all probability the exciting cause of the tumour. In several of my other cases, too, the same connexion was observed—indeed, in my experience, external violence is a very frequent cause of the disease. As a rule, too, I find that the position of the tumour bears some relation to the point of external violence. The tumour is often found beneath the seat of the injury or at the point of *contre-coup*.

[1] *West Riding Reports*, vol vi. p. 292.

[2] *Introduction to Anatomy*, p. 296.

ARTICLE V.—*Case of Poisoning by Opium. Fatal Termination after Thirty-six Hours. Quantity Swallowed, about Twelve Drachms.* By T. GOODALL NASMYTH, M.B., C.M., Cowdenbeath, Fife ; Medical Officer for Beath and Dalgety Parishes.

WAS sent for on 27th June, in the afternoon, to see a woman who had taken a poisonous dose of laudanum. Before I could be at the patient's house several hours would have elapsed since the time she took the dose, so I feared that no efforts would be of any avail; however, I took a stomach-pump. On my arrival I found that the woman had been kept alive by the endeavours of my friend Dr M'Kay, who kept up artificial respiration from the time he was sent for, about an hour after the dose. He stated that on his arrival the patient was almost moribund, the respiration almost stopped, but at once survived under artificial respiration. Those who saw the woman after she had taken the suicidal dose, said that she fell asleep about fifteen minutes after, and could not be roused nor moved about, as they wisely attempted to do. They endeavoured to give her emetics, but these she refused. Dr M'Kay endeavoured to rouse her by dashing cold water on her; but this had no effect, and he simply and wisely kept up artificial respiration. I introduced the tube of the pump with difficulty—I suppose from the relaxed condition of the muscles of the pharynx—and drew off a large quantity of laudanum. We then pumped water into the stomach, and withdrew it repeatedly, till that drawn off had no smell of laudanum. The quantity we got was considerable, and astonished us, as it was more than three hours since it had been swallowed. We then injected coffee into the stomach, with milk and small quantities of whisky. Artificial respiration was kept up all this time, and was only discontinued six hours after the time it was first used. Up to this time the breathing threatened to stop, but after went on quite well. We continued to inject nutriment into the stomach and rectum, and had the satisfaction to see the patient's pulse reviving, and the temperature of the body rising. She gained consciousness to a considerable extent, spoke to her relatives, and swallowed milk with considerable desire, and altogether the case seemed hopeful. When allowed she passed into a drowsy state, but could easily be roused. The symptoms gradually took on a graver aspect, the drowsiness passed into a state of coma, the body began to cool, the breathing became again stertorous, and she died thirty-six hours after having taken the dose.

How she lived so long was a wonder to me, considering the dose, and the length of time it was in the stomach. The effect of the large dose seemed to prevent absorption, as is noticed in the collapse of cholera; and no further poisoning of the system occurred until the effect of that portion which was first absorbed passed off, and then another quantity was absorbed, causing the insensibility to deepen, and death to occur. All the poison could not possibly have been removed from the stomach, and a large quantity must have reached the duodenum before the stomach-pump was used at all. The theory of collapse may be absurd, but it seems feasible to me, and to explain why death did not occur earlier.

ARTICLE VI.—*On Croup: Its Nature and Treatment.* By JOHN MOIR, L.R.C.P. Edin., etc.; District Medical Officer, West Ham Union, London.

THE object of the following pages is to present within moderate compass the results of the most matured and trustworthy investigations of the nature, symptoms, and treatment of croup—a complaint which from its frequency, distressingly alarming and often fatal results, is worthy of the most serious consideration.

I have no new theory to advance, but simply propose stating the views I consider well founded and correct, and have been led to adopt from numerous cases which from time to time have come under my own observation and treatment, both in my own practice and that of others, as well as from the written records on the subject of many eminent physicians and surgeons. Where I have merely adopted generally received results, I have avoided, as unnecessary, giving special references, but on special views, matters of doubt, disputation, and controversy, I have throughout indicated the source of my information, leaving it to be consulted for further minutiæ or verification. I have not neglected to give views differing from those here advocated, but have endeavoured to prove that there is strong ground for rejecting them; though with the reasonable hope that the *ultimate results* of different opinions will be of benefit to many, both in the *empirical*, by which I mean that which relates to experience, and also in the *rational* treatment of this malady; and I am not without confidence that croup has now become, particularly by the light shed on it by pathological research, more thoroughly known as to its exact nature, and consequently more tractable and controllable by the art of medicine. Like Nola, who wrote in 1620, as Brétonneau mentions, and for a similar reason, I pass on to the subject without further preliminary, remembering the truth of the adage, "ars longa, vita brevis."

I. THE NATURE OF CROUP.

Croup, signifying a noise in the throat, such as is made by crows or frogs, received its name from Dr Francis Home in 1765, and was so called by him from the fact that such was the vulgar name for it in that part of Scotland, Mid-Lothian, and particularly

Musselburgh and Leith, where he observed it, describing it as a uffocative affection of the breathing, with formation of a false membrane. Croup, that is to say membranous croup, the only affection we are here considering, has also received the names racheitis, cynanche trachealis, laryngitis fibrinosa, angina tracheális, etc.

For a long time the nature of this complaint was unknown—indeed it was not until the year 1740 that Ghisi pointed out its dependence on the pseudo-membranous exudation which lines the air passages. Among the ancients, Aretæus first describes it under the name of the Egyptian or Syriac ulcer—"tussis spirandique difficultas enascitur," says he, "et modus vero mortis quam miserrimus accidit. Pallida his seu livida facies, tristantur cum tonsillæ comprimuntur. Cumque decumbunt, surgunt ut sedeant, decubitum non ferentes; quod si sedent, quiete carentes iterum decumbere coguntur; plerumque recti stantes obambulant, nam quiescere nequeunt. Inspiratio magna est, expiratio vero parva; raucitas adest vocisque defectio. Hæc signa in pejus ruunt cum subito in terram collapsis anima deficit. . . . . . At si in pectus per arteriam id malum invadat, illo eodem die strangulat. Pueri usque ad pubertatem maxime hoc morbo tentantur." M. Brétonneau, in his Second Memoir (Dr Semple's), New Sydenham Society's Translation, 1859, gives a *résumé* of the historical evidence to that date, and among other interesting details he remarks that in Spain, the name garotilla was applied to the affection, because in fatal cases the victims perished as if strangled by a cord. The Neapolitans called it, from its most formidable symptom, *malè in cannâ,* disease of the air-tube or trachea. "It often happens," says Mercatus, physician to Philip II. and Philip III. of Spain, "that those who are attacked with the garotilla perish in less than four days, instar laqueo suffocatorum." Heredia, physician to Philip IV., Fonseca, and other Spanish physicians, verify this statement.

Many similar observations were made, but all confounding, or at any rate classifying, this malady as a malignant angina until Ghisi's, in 1740; then Samuel Barr of New York, Starr of Cornwall, Rosen, Bergius, Cullen, and others distinguish these affections. Michaëlis of Gottingen distinguishes them by referring to malignant angina all the cases in which fœtor of the breath has been particularly observed, especially if at the same time spots have been seen in the *pharynx.* "But in the case," he says, "in which fragments of false membrane have been expelled by the efforts of coughing, there is no doubt that this was not really our disease." There is no question that it was the want of pathological research that so long prevented the true nature of this complaint becoming known, and caused Fothergill, Huxham, Marteau, etc., to class together different affections of the throat.

It is to M. Brétonneau, however, about the year 1821, that we are chiefly indebted for our first elaborated, and, with one exception presently to be noted, correct views of croup. His observations were followed by those of Guersant, Trousseau, and other French physicians, who entirely agree with him, the sum of their observations being that epidemic malignant angina is a non-gangrenous affection, to which he gave the name diphthérite, or diphtheria, identical with croup in its pathological characters, and found combined with it in most epidemics. This is the one point in which I venture to affirm that Brétonneau, and with him men of such distinction as Trousseau, in his own country, and Sir William Jenner in our own, are incorrect, although the question is even now *sub iudice*, and as Dr Charles West, in a recent debate, has well remarked, the last word on the question has yet to be said, I hold strongly that membranous croup and diphtheria are distinct diseases, not identical, and in so doing I believe I affirm the belief generally held in this country, and one of the utmost importance as regards treatment, not only in croup but in diphtheria also. It is true that many physicians in this country, the late Dr T. Hillier, Dr G. Johnson, Sir W. Jenner, Sir T. Watson, Dr R. Semple, etc., most excellent and careful observers, believe in the identity of the two diseases; but the weight of evidence appears notwithstanding to be on the other side. Even eminent observers in France (such as Bland, as early as 1827, in his treatise, "De la Diphthérite et de la Laryngo-Trachéite comparées entre elles," *Nouv. Biblio-théque Med.* tome ii. p. 5) have given elaborate demonstration of the essential differences between croup and diphtheria. Dr Abercrombie of Edinburgh, in his *Diseases of the Stomach*, 1828, incidentally protests against the two diseases being confounded together; and coming to the present day, we have Sir W. Gull, Drs Headlam Greenhow, Warburton Begbie, Jabez Hogg, E. L. Fox, Professor Spence, and a host of others equally eminent, too numerous to mention here. My own observation is against the identity of the two affections, in their clinical, therapeutical, and pathological indications. There are points of agreement, and a frequent conjunction of the two, forming diphtheric croup or laryngeal diphtheria, happily a rarer disease in this country than in France; but as we have the disease pneumonia, the other disease pleurisy, and a third pleuro-pneumonia, so we have the separate and distinct disease membranous croup, the other disease diphtheria, and also diphtheritic croup. Probably hasty observation, or some other cause, has at times led to the discovery of more cases of diphtheria in this country than actually occur, for I well remember in the year 1863-64, while very many cases were said to have been observed in Edinburgh, some undoubtedly genuine, not one was seen in any patient of the Royal Public Dispensary, although during the time more than 3000 cases came under treatment through that institution, and the only case I saw at that time was one in the private practice of Dr T. Balfour, brother to the distinguished Professor of Botany in Edinburgh University. Dr A. Gloag, of the Castle Green Dispensary, Bristol, also informed me, that in upwards of 6000 cases coming under his notice there, not one case of diphtheria occurred, and others have made similar observations. I can only account for the discrepancy by suggesting, that we know as yet less of diphtheria than our French *confrères*, as they see so much more of it; and they are not quite so familiar with croup, which is a much more usual form of disease in our country than it is with them.

Sir William Gull, in a note to Mr Jabez Hogg, remarks—"I am on all grounds glad to receive your paper on croupous and diphtheritic membranes. I have on *clinical* grounds always regarded the confusion of croup proper with diphtheria as a *pernicious error;* the two maladies have little in common besides the most superficial features."

Dr J. Warburton Begbie says—"Croup and diphtheria differ essentially; the latter is a *specific blood disease*, of which the throat affection is the local manifestation; the former, on the other hand, is an inflammatory affection of the trachea and larynx, characterized by the formation of a false membrane, which membrane tends to pass downwards into the larger and even smaller bronchial divisions, but very rarely in the croup of this country is visible in the pharynx, the common seat of the diphtheritic exudations. Diphtheria must be treated as a constitutional disease; croup requires such also, but of a very different kind," etc.

Dr E. L. Fox, senior physician to the Bristol Royal Infirmary, says that "membranous croup is a disease by itself, attacking the air-passages mainly, if not solely. The tendency to it is often hereditary. Diphtheria is a specific disease, attacking mainly the parts above the glottis, or denuded surfaces of the skin, and somewhat rarely the larynx, trachea, and bronchi; and that in most cases the affection of the air-passages is later than of the other regions. Exceptional cases occur, in which the air-passages are first affected, and the parts above the glottis later. And, perhaps, in the course of an epidemic, an occasional case of diphtheria will be met with attacking the air-passages only. The general character of the false membrane in the larynx and trachea *may* be very similar in both diseases. In its etiology, in many of its symptoms, in its sequelæ, in the regions most usually affected, in the treatment necessary, in its mode of destroying the patient, and in its contagious properties, diphtheria is distinct from membranous croup. Nevertheless, the diagnosis is not always easy."—*St George's Hosp. Reports*, 1877.

The two diseases differ, as we shall see, in the symptoms, but not only so, in the very *position* and *character* of the morbid changes on the mucous membrane. In croup there is a pellicular membrane indeed, but it is almost confined to the *air-passages* and centres in the trachea (it seldom extends to the pharynx, but often to the bronchi); in diphtheria it usually begins in the pharynx, and often extends down the œsophagus, this causing, as a general rule, greater inability to take food than in croup. Croup is also a much more inflammatory disease than diphtheria, and is less seldom accompanied by the low and dangerous form of fever usual in diphtheria; the former is of the sthenic type, the latter of the asthenic type of disease. The glandular swelling in the neck behind the angle of the jaw in diphtheria is usually wanting in croup. In croup there is no fœtor of the breath; in diphtheria there is. Again, after the acute symptoms are over in diphtheria, recovery may be delayed by paralytic symptoms of various kinds, never observable under similar circumstances in croup. Dr Headlam Greenhow says—"There is no doubt that, as a general rule, the more severe cases of diphtheria are followed by one or more phenomena of a peculiar kind. These consist chiefly of impaired, perverted, or excessive sensibility, together with more or less complete paralysis of the muscles of the fauces, pharynx, tongue, lips, extremities, trunk, and neck; the frequency of the occurrence of these symptoms being nearly in accordance with the order named—those of the fauces being the most, and those of the neck being the least, frequently affected. Next to the affection of the fauces, impairment of vision, probably due to paralysis of the ciliary muscle, is perhaps the most frequent of the nerve affections due to diphtheria." Two cases of paralysis of the palate following diphtheria came under my notice in Dr Begbie's Ward in the Edinburgh Royal Infirmary in the summer of 1864, and in 1871 I had a case in Durness of impairment of vision as above-mentioned after a slight attack of diphtheria,—in fact, however mild and however limited the local manifestations may be, I have always found in my cases evidence of a general affection of the system as well, indicative of its nature as a specific blood disease; this I have not found in croup, although my experience of the latter has been much greater than of diphtheria.

In diphtheria the pellicular inflammation, which, in croup, is confined to the air-passages, may extend, as we have seen, into the œsophagus, but it may also extend to the mouth, tongue, and lips, the posterior and anterior nares (Brétonneau), behind the ears, on the sores of blisters,—hence the danger of applying blisters in these cases,—on the conjunctiva (*Med. Gazette*, vol. xxxv., p. 594; also Graefe, Magne, etc., in *Moniteur des Hôp.*, No. 74; Mr Jabez Hogg), and even, as recorded by Dr Matthews Duncan, on the uterus. Croup is an affection of children, diphtheria of all ages; more males have croup and die than females, in diphtheria more females than males. In croup, damp, cold, and moisture are the chief causes, and heredity; in diphtheria, contagion, insanitary conditions chiefly operate, probably some germ, as suggested by, among others, Dr W. Roberts, of Manchester, in delivering the address on medicine to the British Med. Association in August 1877,—anticipated in this, however, and in its power of producing in others, not diphtheria, but scarlatina, by J. West Walker, M.B. (*On Diphtheria and Diphtheritic Diseases*, by J. W. Walker. Churchill, London, 1864). Croup is sporadic, diphtheria is epidemic. In diphtheria, the laryngeal symptoms seldom occur before the third or fourth day, if they occur at all; in croup, from the commencement. In croup

there is no epistaxis or bloody expectoration, common in diphtheria; in croup, also, there is no depression of the heart in the early stages; in diphtheria there is, and usually enlarged spleen, absent in croup; increase of urea in diphtheria, none in croup. But, further, in diphtheria, as distinguished from croup, there is not unfrequently a liability to dangerous interruption of the renal functions from an albuminous condition of the urine; this is seldom remarked in croup, and is a distinction of some importance; it is never so marked as it usually is in diphtheria. M. Abeille found it in two out of every three cases in one epidemic, and in one-third of the cases in another, so that it varies. Mangin has also made some valuable and conclusive observations on this subject. Sir Wm. Jenner is the principal authority in this country. M. Abeille takes the same view of *albuminuria* in diphtheria as Trousseau, regarding it as *the direct consequence of the specific morbid condition of the blood*, which is believed to exist in these cases. Diphtheria is therefore less under our control than croup, and in it tracheotomy is much less useful than in true membranous croup. In croup, defervescence occurs in favourable cases without pulmonary mischief about the third to the fifth day, in diphtheria not till the sixth, or in severe cases the twelfth or fourteenth. Diphtheria and croup differ also considerably as regards the mode and cause of death, which, in diphtheria, is principally due to asthenia, or toxæmia affecting the heart and sometimes the brain; and in croup, to asphyxia, resulting from the extension of false membrane to the smaller bronchi, capillary bronchitis, and congestion of the lungs. The late Dr Frederick Steele, a very accurate observer, found that in fatal cases of croup after operation, death generally took place about the *second* day, whereas in cases of diphtheria the local symptoms did not manifest themselves until the *seventh* day, after which the patient gradually sank without any embarrassment of the circulation. As a general rule, death, when it occurs, takes place early in simple croup, while in diphtheritic croup life may be prolonged until the second or third week after operation, and yet the case eventually prove fatal.

But the clinical distinctions between the two diseases have been so often and so well pointed out of late that I need not further mention them. Are there any pathological? In the opinion of Laennec, diseases cannot be more certainly distinguished than by their anatomical characters. Sir J. Alderson remarks: "Post-mortem examinations (and this would include physical, chemical, and microscopic) are, in fact, your greatest, most invaluable opportunities." And this is so, if we take as a corollary the teachings of Dr Wilks, that we must combine pathological with clinical facts.

Recent investigations prove that in both croup and diphtheria the membrane consists largely of corpuscles; but Dr Carpenter warns us, that "it has been too much the habit of pathologists to speak of 'coagulable' or 'plastic' lymph as if it were always one and the same thing; yet it really presents various gradations of character, which are manifested in its different degrees of organizability, and in the diverse nature of the tissues developed from it. Sir James Paget points out two typical forms, the fibrinous and the corpuscular, between which the others are intermediate; and I hold that the membrane of diphtheria partakes more of the fibrinous, and that of croup of the corpuscular character. The fibrinous exudation coagulates into a fibrous clot resembling that of healthy blood, but showing a more distinct fibrillation; the latter (the croupous exudation of Rokitansky) is characterized by the want of any proper coagulation, the fibrous clot being replaced by an aggregation of cells, which in their first appearance resemble very nearly the primordial condition of the corpuscles of the fluids of the absorbent vessels and the colourless corpuscles of the blood. In the "croupous exudation" the false membrane is not plastic, to no extent fibrinous even, but very largely corpuscular. Rindfleisch, the most recent observer, says "it is not fibrous at all, but only apparently so." Moreover, it is usually thin and soft just below the larynx; about the middle of the windpipe, more dense and firm; lower down, generally looser again, pulpy and broken into flat or tubular fragments, and never connected by bloodvessels with the surface from which it proceeds; it can be entirely detached, often with but little difficulty; in fine, it is more brittle, less fibrinous, and much more albuminous than the usual products of inflammation. Mr Campbell De Morgan, in a letter I received from him on this subject between four and five years ago, after stating his belief in the non-identity of croup and diphtheria, says: "There is no evidence that any development goes on in the false membranes; the moment they are exuded they are virtually dead; whereas in morbid growths, properly so called, there is a constant development going on in the new tissue." We find, then, that the corpuscular is the lowest form of the "exudation of lymph." Diphtheria and croup are both in their false membranes forms of this nature, though not and never in an exactly similar degree—croup being a lower form, and, therefore, less organizable than the other.

Mr J. Warrington Haward, from his observations in St George's Hospital and elsewhere, states his belief that "there are two distinct combinations of symptoms, with their associated pathological changes, to one of which may be given the name of croup, to the other diphtheria; that these combinations are constant; and that the elements and terms of the one are never mixed with those of the other (though there may be certain added qualities common to both); that the constant combinations are of the important and essential element in each quantity; and that these are always occurring in the same and distinct association. There is sufficient ground for regarding each of the two diseases made up of these elements as distinct and non-identical."

Mr Campbell De Morgan expresses no doubt that "in these cases the blood is diseased, and in different manners, and there is exudation of special fibrinous material" (that is, fibrinous material special to diphtheria) "and of white blood-corpuscles more or less changed" (in croup).

In answer to my inquiries, my old teacher Mr William Turner, Professor of Anatomy in Edinburgh University, states, on the authority of Dr Sanders, the Professor of Pathology (his information being derived from careful personal research with the microscope), that "the essential difference between the croupous and diphtheritic membranes lies in this, that the croupous membrane affects the epithelial investment of the mucous surface, whilst the diphtheritic is not confined to the surface, but is a product of the entire thickness of the mucous membrane." And here we have the true physiological explanation of the interesting clinical fact that, whereas in diphtheria there are often epistaxis and bloody expectoration, these never occur in croup. Dr Sanders is not alone in his observations; in Germany, similar anatomical distinctions are the bases on which the distinctive differences between the two diseases are rightly founded. The *Lancet* of 29th March 1873, states that "the exudation in diphtheria varies very much, and is decidedly distinct from that of idiopathic croup." M. G. S. Empis, also, although a thorough believer in the identity of croup and diphtheria, and therefore not putting the same interpretation perhaps on his words which we do, in his observations at the Hôpital Necker in 1848, had noticed, and in 1850, in the *Archives Générales de Médecine*, very distinctly enunciated, that "the mucous membrane of the trachea is the only part where we have observed pellicles adherent to a mucous membrane, without the latter having been more or less denuded of its epithelium. On whatever other part I may have had occasion to study diphtheria, whether on the mucous membrane of the lips, the tongue, the pharynx, the nasal fossæ, the vulva, etc., the mucous basement membrane was found in immediate contact with the false membrane, and the epithelium no longer existed." Here we have a close agreement, closer could not be, between two opponent but independent and trustworthy observers, Empis and Sanders; and, not to be too long, I will only bring forward one other, whose competency will be at once acknowledged by all, Mr Jabez Hogg, President of the London Microscopical Society, and Surgeon to the Royal Westminster Ophthalmic Hospital.

In a paper on Diphtheritic Conjunctivitis, a rare affection occurring about once in every thousand cases, Mr Jabez Hogg ably demonstrates the non-identity of croup and diphtheria both in their morbid anatomical and histological characters. His remarks are amply confirmatory, and much more thoroughly complete than the facts observed by Sanders and Empis, as I have above recorded them, and are so thoroughly to the point, that I cannot do better than repeat them here as I find them in the *Lancet* of 15th March 1873. "On looking over the literature of diphtheria," says Mr

Hogg, "I find considerable differences of opinion prevailing, not only on the general and special characters of the disease, but also upon its morbid and histological anatomy."

The important difference between "a fibrillated membrane prone to pass rapidly into the ulcerative process," and "a delicate film" which never penetrates to the deeper structures, and is thrown off very soon after formation, seems to have occurred to no one. "I maintain that a sharp line can be drawn between the histological anatomy of diphtheritic membranes and croupous casts; and, surely, if so, it will no longer be denied that they indicate perfectly distinct and specific forms of disease. I will first glance at the general naked-eye appearance of the tracheal membrane usually found in diphtheria. As its name implies, it is a dense, compact, yellowish-white or reddish-gray coloured, well-formed mass, of from half a line to three lines in thickness. It is usually firmly adherent to the subjacent membrane, and moulded upon it, and is more or less friable; so that, on traction with forceps to detach it, it comes away piecemeal, or in a layer somewhat resembling chamois-leather. If forcibly detached, a breach of continuity of surface is made, and bleeding occurs, as the mucous membrane is always much congested. Frequently a general tumefaction and ulceration involves the muscular tissue, and suppurating points dip down to the cartilages. By no unaided effort of the patients in the extreme paroxysm will the membrane be thrown off.

"In striking contrast, the croupous cast is semi-transparent, delicate, and tender to handle, somewhat gelatinous, and of a pale yellowish colour, easily separable from the subjacent surface as an imperfect cast of the part on which it is formed. It is only after the death of the patient that it is seen to be opaque, and composed of more than one layer. It is generally thrown off during a violent fit of coughing, when the patient finds almost immediate relief from the more urgent symptoms. It is never found so intimately connected with the subjacent mucous membrane as to cause bleeding. It is simply a clean cast of the superficial epithelial layer, closely resembling the cast-off skin shed by some of the lower animals—the growing amphibia, for example.

"The histological differences are much more strongly marked. Diphtheritic membrane requires a good deal of teasing out to fit it for microscopic examination. A power of 350 diameters reveals an aggregation of granular matters, nucleated epithelium, fat-molecules, and minute crystals, held together by interspersed bands of connective tissue. Muco-purulent corpuscles often entangle foreign bodies; and in throat affections, the spores of the oïdium albicans are rapidly developed. The membrane is, in short, a laminated fibroid mass of the superficial and deeper-seated structures, in a later stage involving the submucous tissues, muscles, glands, and cartilages. In sections made from various preparations, portions of all these structures have been well seen, and sometimes I have found considerable hypertrophy of the connective and fibrous tissues.

"A portion of a croupous cast, however, examined under the same power, consists of numerous cylindrical and pavement epithelial cells, granular matter, fat-corpuscles, and mucus, with some occasional foreign bodies, as particles of food entangled in a protoplasmic homogeneous matrix. The columnar epithelial cells retain their cilia, and are filled with clear sarcode, and nucleated. It is, therefore, surmised that these casts are not long retained; probably they are thrown off soon after their formation. Fungus-spores are rarely found entangled in these films, which are characterized by an excessive cell-proliferation rather than a transudation or true exudation. Although some of the croup casts differ a good deal in colour and consistency, connective or fibrous tissue never enters into their composition."

These facts, which have been established by Mr Hogg by repeated demonstrations under the microscope, and verified by Dr Greenfield of St Thomas's Hospital, account, in the most satisfactory manner, for the therapeutic value of emetics in croup, and their utter uselessness in diphtheria.

In a letter I have received from Mr Jabez Hogg on this subject, dated 15th September 1875, he adds to his previous observations: "My friend Dr Greenfield's observations and microscopic examinations were founded upon five well-marked cases of diphtheria; and he appears to confirm me in almost every particular. He found that 'the inflammatory action extended to the larynx and trachea; and that the false membrane removed consisted of a stratified network of tissue, giving the reactions of fibrin, in the meshes of which were entangled altered layers of epithelium-cells and blood-corpuscles.' The membrane throughout was partly catarrhal, with condensed epithelium and a true fibrinous exudation, with, in one case, the spores and fungus-mycelium intermixed. The inflammatory mischief extended and penetrated deeper about the pharynx than it did about the trachea, where there was, however, always a considerable amount of destruction of tissue. He was unable to say whether the fungus was an accidental or a potential agent in the inflammatory process. There is, no doubt, something yet to be learnt in the history of the specific diphtheritic zymosis, which, unlike croup, is of a contagious poisonous nature—often an outgrowth of unsanitary conditions. With regard to croup, there is always one point in its etiology which appears to me not to have received much attention, and yet it is of some importance, as seeming to separate it very widely from diphtheria. I refer to its peculiar hereditariness. I have seen several well-marked instances of this; and I am now attending a family for an affection (strumous) of eye, in which croup has gone down to third generation, affecting the males of the family in particular. No one ever heard of diphtheria having been transmitted from father to son, or from mother to daughter, that I am aware of."

I might have entered into this subject much more fully, but I think I have said enough to show that croup and diphtheria are distinct, not identical. Two recent cases of diphtheria in my practice confirm me in this belief, and fully corroborate Mr Hogg's observations, as, under the microscope, I found connective tissue present in both.

CASE OF CROUP.—Dr Eben Duncan showed the larynx and exudation from a case of croup. He had examined the mucous membrane and the exudation for micrococci, and failed to find any; but, after soaking the cast (of exudation) in water, he found some micrococci were more of a *post-mortem* than of a *præ mortem* nature, and that the micrococci found in the mucous membrane of the throat in diphtheria might have spread into it from the exudation. In many cases the exudation was decomposing during life, and in these there might be micrococci developed before death. He thought the term diphtheria rather vague. There was no one sign pathognomonic of it. Dr James B. Russell said that he had been much struck in examining large masses of statistics from all parts of the country, to see how the disease set down as croup ranked itself with the lung-diseases, while the disease called diphtheria was evidently akin rather to the typhoid and other fevers. He was aware that, in individual cases, there was often difficulty in distinguishing between the two diseases; but, taking the great mass of figures, he was driven to conclude that there must be some difference (*Glasgow Clinical and Pathological Society*, 12th March 1878).—*British Medical Journal*, 30th March 1878.

CROUP AND DIPHTHERIA.—With reference to Mr Pugin Thornton's note on this subject, I would draw his attention to Dr Carl Weigert's paper in the August number of Virchow's *Archiv* (1877, p. 461), entitled "Ueber Croup und Diphtheritis." Dr Weigert has repeated the experiments of Brétonneau, Stricker, Reitz, and others, by injecting irritating substances into the larynx, and he has studied the histological appearances of the resulting changes. These, he finds, presents the peculiar transformation of the epithelium and the other characters of croup in the human subject. This is an important argument in favour of the non-specific nature of the inflammatory process; it has been hitherto held that the false membranes produced in similar experiments have only a superficial resemblance to the true pathological formation.—(Robert Saundby, M.D., Birmingham.)

Dr E. L. Fox says—"No one can doubt the accuracy of Mr Jabez Hogg's observations. But is it not the fact that appearances precisely similar to what he has found in croup may be also found in diphtheria? The converse, however, I believe is never true. My own opportunities of examining the contents of larynx and trachea in cases of diphtheria have not been many; but I do not think that in any case of croup the elastic fibres seen in a diphtheritic slough are ever found. It does seem to me that a disease which may cover the whole pharynx with false membrane, a membrane which, when detached, constantly leaves a bleeding surface, which may exist for two or three weeks in some cases without dipping down into the larynx, and which, in the majority of cases, never does so dip down, is not identical with membranous croup, in which the air-passages are the regions early, primarily, and as an almost universal rule, solely affected, if we except a little tumefaction of the tonsils. Even when in diphtheria the larynx is affected, it is rare for the trachea and bronchi to be so; whereas in far more than half of all fatal cases of croup the trachea and larger bronchi are the seat of the false membrane, and not unfrequently even the ultimate bronchules. The purpuric spotting of many of the internal organs, the fluid condition of the blood, the nephritis, the infarction of various internal viscera, all common in diphtheria, are not found in fatal cases of croup. The false membrane, whether it be caused by a germ, according to Dr Carpenter, West Walker, Dr Roberts of Manchester, and I believe Dr Allan Thomson of Glasgow, and others, is not parasitic, and therefore does not come under the scope of Professor Huxley's able remarks on xenogenesis, in his address to the National Science Association in 1870, in which he says that it is only in pathology we find any approximation to true xenogenesis, and it is furnished by the various structures (as warts, cancer, etc.), in which, under the influence of certain external conditions, elements of the body which should have developed in due subordination to its general plan, set up for themselves, and apply the nourishment they receive to their own purposes. Mr Campbell De Morgan and Dr W. Roberts point out this distinction. Dr William Cumming of Edinburgh, in the *British Medical Journal* 1876, has also given a differential description of the false membranes of croup and diphtheria, agreeing essentially with the foregoing observations.

(To be continued.)

ARTICLE VII.—*On the Etiology and History of Leprosy.* By W. MUNRO, M.D., Manchester, late of London.

(Continued from page 234.)

Heredity.—Perhaps no opinion in regard to the etiology of leprosy has been more constantly or more confidently put forward than the one that it is certainly or even chiefly hereditary,[1] so many, to a superficial glance, appear to be the proofs that such is the case, while, on a careful examination of these proofs, they will be found to be almost, if not quite, as Landré thinks they are worthless, and at the most only point to a possibly hereditarily received predisposition as a cause in a few cases, which cases, however, might be as well, if not better, explained by the theory of contagion.

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[1] See Schillingius, *op. cit.*, pp. 31-33. (He, be it remarked, states distinctly that children of lepers, while most obnoxious to the disease, and taking it early when they remain with their parents, *escape if they are removed from them; thus*, of course, being removed from the *contagion.*) Pruner, *lib. cit.*, p. 172. Macnamara, *op. cit.*, p. 17—"80 per cent. of 69 medical officers reporting think it hereditary." Dan. and Boeck, *op. cit.*, p. 82 *et seq.* Wise, quoting Hindoo writers, *lib. cit.*, p. 259. Wortabet, *lib. cit.*, p. 189. Hebra, vol. iv. p. 186. Planck in *Br. Med. Jour.*, vol. i. p. 434 (1877). Simpson, *op. cit.*, 1842, p. 406. Coll. Phys. Rep., p. 231 (Wilson), and elsewhere.

The proof chiefly relied on has been the occurrence of the disease in more than one member of a family, using the word as inclusive of uncles, aunts, and cousins. An example of this kind of reasoning is seen in the description by Liveing of a case of leprosy coming from Guernsey,[1] in a man whose *father* became a leper in India, and he (the son) was attacked at the age of fifteen. He had, Dr Liveing states, several brothers and sisters older than himself, *all* healthy, yet, in the face of this, Dr Liveing at once jumps to the conclusion that "it is really a hereditary case of the disease, though I admit there is some doubt on this point." But the father *cohabited with a coloured woman in India;*[2] if, as seems reasonable to believe, *he* took it from that woman, surely it is more likely that his son, living with him, took it from him than that heredity is the cause of the son's illness. Besides, Dr Liveing does not appear even to have inquired whether the father became a leper before or after the son's birth; if *before*, there might be some colouring given to the idea of heredity; if after, nothing but contagion could account for the son's attack. It is a great pity that the inquiries in such an important case should have been so very insufficiently made.

I have spoken at length of the case, because it gives a good example of the style of reasoning which has been used in regard to the heredity of the disease, Danielssen and Boeck themselves not having distinguished the periods of birth of children with respect to the times of life at which the parents became affected, and having always accepted the fact that two members of a family were affected as sufficient proof of heredity. This has also been done by Planck, Carter (up to 1874, but not in his last report, in which he admits the probable contagiousness of the disease), and many others. The practical outcome of this error has been that, reasoning in a circle, those authors have denied that the disease is contagious, because, being hereditary, cases occurring in the same family are so accounted for, while at the same time its non-contagious nature is stated as a proof of its hereditariness. It would just be as reasonable to say that scarlet fever is hereditary, because, as is constantly the case, children take it whose parents have had it, and two or three members of a family have it at one time.

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[1] *Med. Times*, vol. ii., 1877, p. 644.

[2] This is the first case I have heard of, of a *private soldier* (which the father was) in British India contracting the disease, and, as an exception to the rule, bear out in a remarkable manner what I have already said as to the reasons of the immunity of soldiers, viz., the want of opportunity for the action of contagion, this man having obtained these opportunities, and suffered the consequences. The case is like that of the officer mentioned in the Coll. Phys. Rep., p. 241. Landré speaks of *Dutch* private soldiers being affected, while ladies never are, y never being exposed to contagion (p. 45).

Let us for a moment ask, how is a hereditary disease known to be so, and then see whether leprosy shows such characteristics as warrant us in classing it among such diseases.

A hereditary disease is, then, one transmitted from parents to offspring, from *generation to generation*, or grandparent to grandchild, and under ordinarily favourable circumstances for its development, and often, in strongly hereditary[1] diseases, as phthisis, scrofula, etc., without such favourable circumstances; it is so transmitted whether the children live with their parents or not. The tendency to attack in the children is greatly increased by intermarriage of affected persons, and when there are a number of children in one family, generally about one-half, and often all or nearly all, are affected, especially when the parents suffer from the disease at the time of, or previous to, the birth of the children; finally, the children are *always affected after the parents.* I have no hesitation in saying, that no proofs can be brought forward to show that leprosy has the above-mentioned characters.

Firstly, let us see the value of the argument founded on more than one person being affected in a family, the word being used to include all relations to the fourth generation, as Danielssen and Boeck have done,[2] and from which they have concluded, that in 213 cases 189 were hereditary, such cases being most frequent on the *maternal* side and in the second and fourth generations. Now, when we remember that, if all relatives within the fourth degree are included, as many as 50 to 100 or more persons would be taken in, there is nothing wonderful that in Bergen, where every four-hundredth person is a leper,[3] or in St Kitts with nearly the same, even apart from contagion, some families should have two or more members affected. Again, as a man has twice as many grandparents as parents, this would account for the greater frequency in the second generation.

But is the argument founded on collaterals being affected of any value? I think not. In the cases I inquired into in St Kitts, out of 72 cases, in 8 the family history was uncertain, but in 2 of these 8 the uncertainty was only in regard to the grandparents, all others were healthy. Among the remaining 64 the most careful inquiry from the patient's friends and residents on the estates in regard to relations could elicit no history of leprosy in the family in 34 cases.[4] The other 30 had leprosy in both lines in 4 cases, in the direct line only in 5, and in the indirect line only in 21 cases; of these 21, 3 were in brothers or sisters *living together*, one case only becoming affected four years after her brother, who was attacked in Antigua, but returned and lived in the same house with her. There were 5 in brothers and sisters, and also in uncles and cousins besides, and 13 in uncles, aunts, or cousins (third cousins included). Now, of these 13 I found that 8 were in more or less continuous communication with the affected relatives; in one illustrative case, the boy having lived with his aunt while she was sick, apart from his mother. In 2 cases there was uncertainty as to contact, but in one of those who had been twenty years sick, his leprous aunt died of cholera three years after his attack, and he had lived all his life in one village beside his family and relations. In 3 instances only was it stated that there had been little or no communication, but of the truth of this statement I am more than doubtful in one case; and in another case whose half-niece was affected twelve years *before* him, he attributed his illness to *sleeping with a leper*—an example of the danger of concluding that such a case is necessarily hereditary, because there has been no contact with the affected relatives.[1]

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[1] Nouveau Dictionnaire de Med., tom. xvii. p. 451. [2] *Op. cit.*, p. 335.

[3] 1 in 508 in south, and 1 in 272 in northern department.

[4] Landré (pp. 32 and 34) quotes Beiro, of Portugal, who only found 5 in 43 with even one other member of the family affected. Van Someren in Madras found only 2 in 31 cases descended from lepers. Porteus (Coll. Phys. Rep., p. 103) found among 31 lepers the mothers of only 2 had been affected, and 2 fathers; and Dr Day knew of many instances where only one member

From these figures it is clear, that unless the disease were proved to be non-contagious, the fact of its existing in the collateral line is no proof of heredity. The following series of cases will more forcibly illustrate this:[2]—William Mully, a white labourer, was attacked in 1857, having with his brother come to St Kitts in 1835; he died in 1862. Meanwhile, George Mully, his brother, took ill about 1861–62; he died in 1868. Thomas Naylor, a son of a second cousin of those brothers, born in St Kitts (the father came out in 1835, having been at school in Suffolk with the Mullys), was attacked about 1862–63; then a cousin of Thomas Naylor, William Hart, who, in consequence of his mother's death, lived four years with his uncle and cousins *while T. Naylor was sick*, and also lived on the same estate as George Mully and beside him, took sick about 1868. Lastly, the sister of Thomas Naylor was attacked in 1869. Now, had these been blacks, a more apparently conclusive suite of "hereditary" cases in the collateral line could hardly have been imagined; but as the Mullys were English and the three others of direct English descent, this idea is utterly untenable; while as they were naturally, being *poor whites*, from the same village, and living near one another, in constant communication, contagion would at once account for all the cases.

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was affected. Porteus mentions that the 31 lepers had 111 healthy brothers and sisters.

[1] Dan. and Boeck, p. 514, mentions a case in Provence, whose sister was leprous, but who blamed sleeping with a leper as the cause of his disease.

[2] The necessarily total absence of heredity in the Sandwich Islands, already mentioned, is worth keeping in view when considering these cases.

I think I have said enough to show that the existence of leprosy in the indirect line is no proof of heredity.

But in 4 of the 72 cases there was leprosy in both lines, and the question arises, would this prove heredity? In the *first* of these four, Rebecca Fleming, age 30 years, the mother's mother and mother's half-brother were affected. But the latter was attacked twelve years *after* Rebecca, who was attacked when 15 years of age (his is the case mentioned already who slept with a leper), and it is more than probable that she was in contact with her grandmother, living as she did on the same estate. I may say here, that her mother's husband's daughter by a first wife, Catharine M., who *slept with Rebecca while she was sick*, became affected, although there was no leprosy in *Catharine's* family.

In the second case, Drusilla Elliot, age 24, attacked at 21 years (about 1868), her mother and niece were lepers, but the niece Ann Peats (the third case) was sick twelve years *before* the aunt. Ann lived about three miles from Drusilla in 1872, and there was no constant communication between them then, both being ill; but I believe that such communication took place previously. Drusilla's mother died in 1856, having been many years a leper, being one, so far as I could ascertain, when Drusilla was born.

Thus, Drusilla may have been infected by her mother previous to the latter's death, the twelve intervening years (if it really was so much, for it is possible and even probable that slight symptoms existed unnoticed for some years before 1868) being a perfectly possible period of incubation, or from Ann Peats, or, as in the case of Rebecca Fleming's uncle, from some other leper. All these possibilities would have to be disproved before the case could be looked on as proved to be hereditary. The third case, Ann Peats, born about 1854, became a leper about 1856, the year her grandmother (Drusilla's mother) died. From the confused statements made, it is uncertain whether her grandmother nursed her, it being stated that the latter was dead before Ann was born; but this, if the dates were correct, is an evident error, being an instance of the difficulty of obtaining such information among negroes. Even if she never did come in contact with her grandmother, however, the idea of heredity is negatived by the fact, that Ann was the *only child attacked in a family of thirteen brothers and sisters.*

The fourth case, Mary Jackson, whose father and second cousin were lepers, was the only *member of her family who lived with her father when he was sick*, he being separated from her mother. Thus, these cases also can be most readily accounted for by contagion.

Lastly, there were *five* cases with the disease in the direct line only. Of these, two were in a mother, R. P., and son, the latter 6 years of age. The mother was attacked, and some time afterwards the child, when he was about four years old. The mother was apparently healthy when he was born, but her father was a leper; the latter died a long time before. The boy's father was healthy. I could not ascertain satisfactorily whether R. P. L. lived with her father when he was sick or not, but the child was never in contact with him.

In the third case (in which I had great difficulty in getting any information), J. W., age 25, attacked at 19 years of age, stated that her mother was a leper, but not, so far as I could ascertain, till some time after J. W. was born. The fourth case, A. Y., lived with her mother, from whom she supposed she had got it, and was attacked at 26 years of age; she was 40 years old when I saw her. The fifth and last case, Alicia W., lived with and attended to her father when he was sick. She was attacked at 12 years of age.

Thus there is nothing in this series of cases to prove heredity, but rather the reverse, so long as the possibility of contagion in close contact is at all admitted.

I would say here also, that even in such cases as the first two of those five, were the mother even affected before the birth of the child, the fact that the child is a leper is no proof of heredity, in the true sense of the term, as there can be no closer communication than that between mother and child, so that the latter may possibly become affected with the disease as an infant or *in utero*, not, I believe, by hereditary transmission, but by infection.[1]

As to heredity from the father's side, one great difficulty in accepting this doctrine is, that the disease most decidedly prevents men having families.[2] In St Kitts I found that among 18 male lepers over 21 years, 9 were married and 6 had families, all of whom, however, with the exception of two children born to one man, were born *before* the patients became lepers (except in one case in which the last child was born one month after the father's attack).

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[1] See Coll. Phys. Rep., pp. 70 and 102; and case 20, in Danielssen and Boeck, p. 436. I think light may be thrown on this by a consideration of what takes place in so-called hereditary syphilis, transmitted from the father to the child through the mother, but which, in spite of the opinions of even such as Trousseau to the contrary, never seems to take place, *unless the mother is previously infected* (*Dict. de Médecine*, tom. xvii. p. 468), being, in fact, syphilis transmitted by infection through the mother. A somewhat similar error is made in concluding that cases of children attacked at three and four years of age with leprosy (whose mothers are lepers before their birth), are so from heredity, such cases being more probably really cases of contagion from the mother, the disease being possibly transmitted during intra-fœtal life or during the nursing period, and incubating for three years or so. It is observed that when the mother is affected at or about the time of the child's birth, the disease is apt to appear earlier in the children than when the father is affected (see Coll. Phys. Rep., p. 102). In only one case did I see children born to a man *after* he became a confirmed leper—these were three and eight years old, and perfectly healthy (evidence, so far as one case is of any value, against the heredity of the disease), so that the full analogy, with the transmission of syphilis, can hardly be carried out; but I have thought it worth while to draw attention to an apparent misuse of the word "hereditary" in regard to syphilis, so that the same error may not be repeated, as it often has been, in connexion with leprosy.

[2] Holmsen only found 1 case among 12 in which parent and child were affected in which the parent was affected *before* the birth of the child.

One man, attacked at 49 years of age, had eight children. Of the 9 unmarried, 6, attacked at various periods from 7 to 17 years of age, were simply incapable of being married, having the appearance at 21 and 22 years of age of boys of 15 or 16, shrivelled up by the disease. The other three, aged 30, 34, and 46 in 1872, attacked at 24, 20, and 25 years, had no chance of being married on account of the disease. Thus, if the disease is only to be looked on as possibly hereditary when occurring in children born *after* their fathers are attacked (and this is, I think, the most correct view), not one of the men could transmit it, so far as my observations go, the only two children born after their father's attack being healthy. Such cases show the absurdity of arguing that heredity is the chief mode of transmission of the disease, as it is plain enough that it rather stamps itself out, for when it attacks the male before puberty, it prevents the reproductive powers being developed, when about puberty it prevents marriage, and after marriage puts an end, in the majority of cases, to the reproductive power.[1]

As to females, I found in St Kitts, among 26 women (over 21 years), 9 had had children, 7 having had them *before* the disease appeared. I saw only one woman who had had *two* children *after* she was attacked—two, one 11 days, the other 3½ years old, both healthy; and in one other case, attacked at 34 years of age, who had children and grandchildren all healthy.[2] I am not quite certain whether any children were born after her attack, but believe not. Wortabet appears to be right in saying, that males lose the power of reproduction earliest.[3]

Again, of these 15 men and women, 6 had also grandchildren, yet not one of them were affected. All the families were perfectly healthy, with the exception of the *one* child of R. P. already mentioned, born *before* the mother's attack. In India, Lewis and Cunningham (p. 62) found the following results among 52 lepers:—25 males had had 27 children, 0 leprous, 4 dead; 27 females had had 76 children, 5 leprous, 30 dead, or a total of 5 leprous children among 109, or only taking the *living*, 69, far too small a proportion to show heredity. It is possible and even likely that, had those five been removed at once after birth from their mothers, to avoid contagion, they might have escaped. The proportion given above is even less than the three in 32 reported on in the "Coll. Phys. Rep." (p. 161).

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[1] Milroy (p. 5), "In a large proportion of leprous unions (in Berbice) there was no progeny at all."

[2] I have lately heard that one of the seven has had a child since 1872, which died *not* a leper at 18 months.

[3] This nullifies to a great extent the argument that the disease is not contagious, because wives seldom take it from husbands. See also on this, Lewis and Cunningham, pp. 63 and 64, a Table showing clearly that *the earlier the age of attack the fewer children lepers have.* Wortabet also says, that the disease comes chiefly from the mother, owing to loss of reproductive power in males (*op. cit.*, p. 189).

Another proof against heredity is the great number of cases in which there is only one leper in a family, including relatives. I have already mentioned the number in St Kitts, which was 34 in 66, and Danielssen and Boeck,[1] Brassac, Milroy (p. 3), and others, mention cases to the same effect. But even *among the other* 32 in St Kitts, on careful inquiry, I found cases such as the following:—An uncle had been, and his niece and nephew were, affected, but *that uncle himself* was one of a family of *thirteen* children, *all of whom grew to middle age perfectly healthy*, as Dr Boon was able to assure me, he having known them all. And this is only one instance of families of twelve, six, and four brothers and sisters, inquired into by me, in which only one brother or sister was affected, showing of itself that the disease was not hereditary. In no family, including relations, have I ever seen among the blacks more than three members affected, and that of the uncle, nephew, and niece just mentioned was one of these.

Reading, therefore, Danielssen and Boeck's Tables, as well as Mr Planck's, and Lewis and Cunningham's statistics (made up, as Dr Carter says, of India in regard to a people who live in little communities), and also, were it necessary, Dr Carter's Tables, in his 1874 Report, which he seems to attach little weight to, as he so readily expresses his belief now in the possibly contagious nature of leprosy;[2] reading those in the light I have endeavoured to throw on them, I cannot think they are of the slightest value in proving heredity.

I have already quoted a case of an aunt affected *after* her niece, and an uncle *after* his niece, and I may also mention the case of a mother attacked *after* her son's death from leprosy. The case was related to me by Dr Boon, an old resident in St Kitts, who knew the lady. A similar case is mentioned by Schillingius,[3] and two cases of mothers after daughters by Max of Duran Fardel (*Gazette Méd. de Paris*, 14th July 1877); and a case in which the mother, father, and another child were attacked after an European child, who herself had been infected from a boy (*Landré*, p. 51). These cases clearly point to contagion, the mothers having nursed the children, and are against its being hereditary, as hereditary diseases are handed *to* descendants, not from them.

Again, in hereditary diseases when both parents are affected, it is certain that most of the children will be so, under circumstances favourable for its development. Yet Pruner mentions that he has seen "not only children, but married people, quite sound whose parents both died leprous."[1] Lewis and Cunningham's Table (p. 65) shows that in four families with 24 children, both parents being affected, 11 were lepers; but even in two of these families only one out of three in one, and of four children in another, were so. In ten families in which the mother only was affected, 13 children out of 32 were lepers, a slightly lower proportion than when both parents were affected (readily accounted for by the increased chances of contagion), and five of these families, with four to six children each, had only one child affected. In these families, again, in which the father only was a leper, only three children were so—one in each family. Two families contained five each, and one, two children. This would show the less tendency for the disease to follow the father having it.

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[1] P. 376, *et seq.*, "Coll. Phys. Rep.," *passim; Gaz. Med. de Paris*, 14th July 1877, etc.

[2] I can pay Dr Carter no higher compliment than to express my admiration for his readiness to give up any received theory which he has given much labour to prove the correctness of, when formerly unknown circumstances show that another theory explains the facts better.

[3] He quotes from Pallas. She was attacked a year after the second son of two affected.

Taking also the absolute number affected in any family and its relations, as compared with the number of individuals contained in such a circle, the idea of heredity, as I have already shown, is not supported.[2]

Finally, it is, to say the least, strange that in China, where lepers intermarry, and are only allowed to marry lepers, that the descendants should be looked on as clean in the fourth generation,[3] an idea which was, still more strange to say, mentioned in regard to the lepers in Martigues,[4] in the south of France, fully a century ago, in one of the very localities in which Danielssen and Boeck, a century later, reported that the disease was propagated by heredity alone.[5]

Now, how could a really hereditary disease ever die out in families in which all the parents were tainted?

In regard to Norway itself, where Danielssen and Boeck chiefly formed their opinions as to the heredity of leprosy, believing that this is the chief cause of its increase in that country (as between 1850 and 1862),[6] as already stated, all the people of the west coast are exposed to the same pernicious influences. Yet, according to the observations of Kierulf,[7] cases arising *de novo*, *i.e.*, according to him, not from heredity, *always arise in places where the disease is endemic, and never where it is unknown*, while, according to Holmsen,[1] when it arises in a new district *it is always caused by a leprous individual.* These facts are entirely against heredity.

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[1] P. 173.

[2] I am aware that the value of such statistics as I have put forward may be questioned, owing to the wish in many persons to conceal the fact that there had been leprosy in the family; but as I made my inquiries with my eyes fully open to this, and never trusted to the statements made to me by the patient alone when other sources of information were available, I have every reason to believe in their correctness. In one case I obtained the family history for five generations back from the boy's grandmother, a most respectable woman well known to me. All were healthy except him.

[3] Landré, p. 37.

[4] "Medical Observations and Inquiries by a Society of Physicians in London," 1757, p. 204. "An account of the leprosy in Martigues, extracted from a French letter to Dr Clephane from Dr Joannis, a physician at Aire, dated 15th October 1755.

[5] P. 514.

[6] In 1850, 1500; in 1862, 2119 lepers, in nearly two million inhabitants.

[7] Virchow's *Archiv*, 1853, b. v. p. 13; and Landré, p. 28.

Summing up, therefore, leprosy is not always, but only very rarely, transmitted from generation to generation, has never been proved to be transmitted without contact, is not constantly transmitted even when both parents are diseased, seldom affects more than one child in a family, and those only successively, independently of age, sometimes the youngest first, after contact, and goes back from child to parent when in contact. From all I have learned of the disease, I can find no proof of even the hereditary predisposition allowed to exist by Virchow, but feel much inclined to believe with Landré, that contagion is the only cause of its propagation. Even one well-authenticated case of a son or daughter of a leper removed in infancy to a country where the disease is unknown, as from the West Indies to England, and becoming a leper twenty or thirty years afterwards, would do more to establish the possibility of hereditary transmission than hundreds of cases of persons who have been exposed to the possibility of contagion either from their parents themselves or others. Such proof might also be sought in localities where it is dying out, where the *last* person affected was the grandchild of a leper, who had never been in contact with his ancestor; but until such proof is adduced, the disease cannot be looked on as hereditary.[2]

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[1] Landré, p. 29.

[2] Such proof is *not* afforded by the case of Berns, the last Shetland leper (Simpson), as it is only stated that the disease was in his family, not if his parents or grandparents, nor if he was ever in contract with such relatives.

Equally unsatisfactory is Boeck's proof (!), which he considers so strong that "natural science surely requires nothing further" (Carter, 1874, Rep. p. 48), from nine Norwegians in America. Of eighteen cases seen, nine left Norway lepers, the *other nine* were attacked two to fourteen years after emigrating; of the first nine, four had leper relatives, five had not; all the second nine had. Now this proof is utterly defective, firstly, because whatever Boeck may believe, the incubative period in cold climates, especially with a good diet, is indefinitely prolonged, possibly beyond eight years, as in Dan. and Boeck's case (p. 339); so that, while those attacked two years after arrival almost *must* have, the one or two attacked fourteen years after, *might* have brought it from Norway; secondly, because only relatives, not leper parents, are mentioned in connexion with the second nine, and we have seen that cousins, etc., having the disease proves nothing; thirdly, because nothing is stated as to the last cases attacked being related to or in contact with the others—a communication almost, if not quite certain to happen among foreigners in a strange land whose community of language would drive them together. It is a pity these points were not inquired into, as without them we must reject the so-called proof, and believe that some of the nine brought the disease with them from Norway; the others either did so or were infected in America.

I do not deny that leprosy may be occasionally hereditary, but only say that it has never been proved to be so.

(To be continued.)

ARTICLE VIII.—*Cases of Hystero-Epilepsy.* By THOMAS INGLIS, F.R.C.P. Ed., etc., Senior Assistant-Physician to the Royal Edinburgh Asylum.

(*Read before Medico-Psychological Association, 14th November* 1878.)

A SOMNAMBULIST, named Simon Fraser, was recently tried at the High Court of Justiciary in Edinburgh for the murder of his child. The case has excited considerable discussion among medico-psychologists as to whether such somnambulists should not be treated as persons of unsound mind. It will be recollected that Fraser, while in the somnambulistic state, and labouring under the hallucination that he saw a wild animal attack his child, to whom he was much attached, seized the infant, and killed it by dashing it against the wall, causing a fracture of the skull, imagining it to be the spectral beast.

Fraser has been a somnambulist from infancy, and it appears that his family for two generations have been sodden with epilepsy, and the child he murdered had had epileptiform convulsions. There being no doubt that the accused when the deed was committed was unconscious of the nature of his act, and being therefore irresponsible, the jury returned a verdict to that effect. The judge stated that arrangements had been made with the prisoner and his friends to prevent a repetition of such a disaster. They were, that the prisoner should use means to cure himself, and in future sleep in a room alone. Such arrangements cannot be regarded as satisfactory. Fraser has on different occasions assaulted several people, and while in jail he attacked a fellow-prisoner with homicidal intent while in this state. Although such somnambulists have not hitherto been reckoned as lunatics, or included in existing classifications of insanity, there can be little doubt that a person who labours under delusions and hallucinations, and executes violent purposive acts which are dangerous to himself and others, although himself unconscious of them, owing to changes in the brain functions, has passed the physiological boundaries of sleep, and entered the domain of insanity.

Coleridge's poem, "Kubla Khan," composed during his sleep, is the familiar instance of automatic mental action, but here, added to automatic brain power is nervo-muscular activity, for the man possessed undoubted volitional power of thought and action, except that he was "unconscious of his own consciousness." He is irresponsible for the acts, because insane during their commission.

The insanity being of short duration should not create difficulty in recognising the disease. Many cases of periodic insanity are detained in asylums, in which the patients are liable to dangerous attacks of mania at distant intervals, because it is known that the attacks will recur, and the patients are proper subjects for restraint. It is more than probable that the accused was in a state analogous to the "epileptic sleep-condition," of which cases have been recorded by Westphal and Fischer (*Allgemeine Zeitschrift für Psychiatrie und psychisch-gerichtliche Medicin*). An epileptic similarly circumstanced would certainly have been put under care and treatment in an asylum.

Fraser suffered from nocturnal incontinence of urine till puberty —a symptom strongly suggestive of an epileptiform condition. He is also somewhat enfeebled in mind. This mental deterioration almost always occurs in the more obscure epileptiform neuroses, such as *le petit mal*, epileptic vertigo, and the various incomplete manifestations of that disorder. In all probability his condition will become aggravated, and in the event of another homicide, the insufficiency of the present arrangements may be unhappily demonstrated.

In the present state of the law on the subject, and their unfrequency in this country, the following cases of insane Hystero-Epileptics with somnambulistic phenomena may not be devoid of interest:—

CASE I.—M. M., a girl aged 17, was admitted to the Royal Edinburgh Asylum on 18th July 1878. After an access of excitement she had attempted suicide by precipitation from a fourth-story window, but was arrested before accomplishing her purpose. She was then conveyed to a police-office, and sent from it to the Asylum, where she was found to be in an unconscious state. After lying in a trance-like condition for eighteen hours, she regained consciousness. She was then perfectly collected and rational, but recollected nothing of what had occurred. No hereditary predisposition to insanity or other neurosis was admitted, but she had suffered from chlorosis, and was of a nervous temperament. This was her first attack. Two days after admission she was noticed to fall asleep while eating her dinner, and in the act of conveying food to her mouth, and afterwards, when engaged washing clothes, she was found standing beside a tub in a state of profound sleep. She could not be roused by shaking her violently, holding strong ammonia to her nose, or by pricking her with needles. Besides these attacks she often walked about in this sleep-condition with open eyes. On one occasion she fell down, but was not convulsed. She tried to resist the sleep coming on, but could not. Patient is a girl of ordinary intelligence, and of a timid, sensitive disposition. She was very anxious to be cured of these attacks. The morbid craving for sympathy, and the exaggerated self-consciousness, so typical of "fashionable hysteria," were quite absent, and also the peevish irritability commonly noticed in such cases.

At night she slept, but complained of horrible dreams, and talked a great deal during her sleep. Pain was frequently complained of in the abdomen.

A new phase of the disease now manifested itself. Patient said she felt a "painful rush" in the left iliac region (ovarian aura), and a feeling of distension of the abdomen. The face became pale and distorted, and she rapidly lost consciousness, and fell. Slight clonic convulsions of the left side of the face, left arm and leg, then took place, while the right side was in a state of tetanic rigidity. Reflex action and common sensation on both sides were abolished during the attack. The pupils dilated, and were insensible to light; pulse 120; temperature 99° Fahrenheit. The attack subsequently could not be distinguished from a "true" epileptic fit. The cyanosis was not so marked as in very severe epileptic fits, but was quite distinct, and a frothy saliva tinged with blood welled from the mouth. Slight confusion of ideas and vertigo succeeded the attacks, but no stupor, and, if the invasion was slighter, consciousness was regained suddenly, and in such cases the saliva escaping from the mouth was viscid and not frothy. She often, but not always, knew for some time when an attack was coming on, and this constitutes one of the diagnostic signs between epilepsy and hystero-epilepsy, the aura in the former being generally of briefer duration. These attacks became intensified in severity, and were succeeded by transient left hemiplegia, its duration varying, according to the intensity of the paroxysms, from a few hours to one or two days. The paralyzed leg was not swung, but dragged straight forward like an inert appendage, as occurs in hysterical paralysis. The tongue was protruded straight, and there was no dragging of the face to the unaffected side. There was slight ptosis of the left eyelid.

Left hemianæsthesia then developed and became complete at times, and affected the special senses. The anæsthetic side was paler and colder than the other. The hands appeared bloodless, and the nails were of a blue colour. The cutaneous sensibility of the right side was exalted. At rarer intervals, while the left leg was numb and cold, the left arm felt hot to the touch, and the palm of the hand perspired freely, although the patient was not aware of it. There was impairment of the sense of temperature, and an ordinary thermometer registered an increase of 1·6 on the anæsthetic side. This is uncommon, as, owing to the bloodlessness of the anæsthetic parts, their temperature is usually one or two degrees lower than normal. She could not distinguish between hot and cold water when her hand was plunged in it, with her eyes blindfolded. Irritation of the skin by pinching did not cause the usual redness and congestion. The analgesia persisted during sleep, and a needle could be passed deeply into her affected arm without awaking her, which appears to be a distinct proof that there was no malingering. Pricking the right foot aroused her at once. The sensibility of the mucous membranes of the nose and eye of the same side was much impaired, and irritants, such as snuff, placed in the nose, failed to cause reflex excitability. Achromotopsia existed in a minor degree, and only affected the left eye, and the sense of smell was impaired on the left side. Hearing was normal, but taste was considerably affected after an attack. The tympanitis present was probably due to a transient paralysis of the muscular coats of the intestines. The modifications of sensibility had a longer duration then the paralysis. The sense of contact and pressure was always regained before restoration of sensibility to pain. The urine was always normal, and no symptoms of ischuria or oliguria have occurred. In addition, she has severe convulsive hysterical attacks, which succeed the epileptiform seizures, in which consciousness is not entirely suspended, and which are attended with violent contortions and hysterical contractures. She cried out frequently when they occurred, but never during the epileptic attacks.

In some cases of epilepsy the patients, instead of having a psychic or convulsive attack, suddenly start off to run with their eyes open, and will evade obstacles in their path, and, when they come to themselves, will be perfectly unconscious of the whole event. M. M. frequently had such vicarious attacks. She could sometimes be roused from them by shaking and pricking her, and applying snuff to her nose. In this condition, or its somnambulistic form, she could see her attendant, but did not recognise her. She had no recollection of what had occurred in her waking conscious state. At these periods somnambulists and epileptics may have perfect control over their movements, and the possession of all or some of the special senses. They, while unconscious, see people, but have no conscious perception. They may act and speak in the same analogical purposing manner as a person fully conscious and acting with reflection. Such a case has been recorded by Professor Westphal of an epileptic, who was tried for indecent exposure of his person to children while in this condition. He was able to act, see, hear, speak, and form opinions at the time of the commission of the incriminated acts, but was quite unconscious. He was acquitted by means of the evidence of Westphal and a Royal Commission. He died of general paralysis, an unusual sequence of epilepsy.—(*Archiv für Psychiatrie und Nervenkrankheiten*, Band vii. heft 3).

This somnambulistic condition was artificially induced by Mr Braid's method for producing hypnotism. Its duration was short, and terminated by an outburst of hysterical weeping and laughter. Unfortunately it was only employed when the patient had greatly improved, so that the influence of magnets and solenoids, while she was in the mesmeric state, could not be tested.

During sleep, and more rarely following an hysterical attack, the arms extended as if crucified, her body became rigid, and assumed the position of the cross, described by Charcot in the *Progrès Medical.* Patient never exhibited ecstasy or delirium, and the pose does not appear to be actuated by any exaggerated religious sentiments, emotionalism, or a desire to attract attention by attempting a silly symbolism. No stupor follows a severe attack, but vertigo, which is always subjective in character, in this respect resembling that of the *vertige épileptique.*

CASE II.—C. S., female, æt. 18, was admitted to the Royal Edinburgh Asylum, on 28th May 1878, under certificates that she was labouring under melancholia, with suicidal tendencies. Her brother states that there is no hereditary predisposition to insanity, but that her mother died of brain fever, and patient got a fright at the age of 15. The attack was brought on by the news of her father's death being brought to her suddenly, when she became depressed, then restless, excited, and developed the delusion that her father was not dead, and that she saw him in the room, and that her brother was insane. She attempted suicide by precipitation from a third-story window, by drowning and poison, and, being quite unmanageable at home, her friends were obliged to send her to an asylum. On admission, patient was found to be a stout girl, of medium size. She was anæmic, and complained of palpitation, but the heart-sounds were pure and regular. Had amenorrhœa, and menstruation has been irregular. For some days after admission patient improved rapidly. The restless depression passed off; she got rid of her delusions and hallucinations, which have not recurred since, and she became quite coherent and rational. At her next menstrual period the menses were almost absent, and her condition became aggravated, several hysterical attacks occurring daily. A week afterwards she got a fright from seeing a patient become excited, and passed into a death-like trance, and lay for three hours in an unconscious cataleptic state. The muscles were in a condition of waxy rigidity, and the limbs remained in any position in which they were placed. She had several epileptiform attacks almost similar to those of M. M., and the symptoms resembled those already described, so that it is unnecessary to do more than point out their distinguishing features. Sickness and vomiting sometimes ushered in the attack. The somnambulistic phenomena were not so marked as in the previous case, but the hystero-epileptic attacks were more severe. They may be arbitrarily divided into two periods, the epileptic and hysterical, the one following the other. The former could not be distinguished from an ordinary epileptic fit, with unilateral convulsions. There was generally absolute loss of consciousness, the patient falling and hurting herself, not slipping down in the careful way in which hysterical patients usually elect to fall. She bit her tongue, foamed at the mouth, and opisthotonos was very pronounced.

The hysterical attacks were of a very pronounced character, in which the most bizarre contortions and contractures took place. This period of the attack corresponds to that called by Charcot "phase des grands movements," and succeeded the epileptiform state, which began either with or without an aurapsychical or sensational pallor, rigidity of right side, and convulsive movements of the left side. It is very difficult to ascertain if consciousness is entirely abolished during this phase, which to some extent corresponds to the old "demoniac possession," but it is certain that during it she was insensible to powerful stimuli. She uttered loud cries and dashed her body about. She knocked her head on the floor, and tore out her hair in handfuls if not prevented. Both sides of the body were now affected by the convulsive movements and contractures, while in the first and epileptiform period only the left side was convulsed. Fantastic emotional attitudes ("phase des attitudes passionelles" of Charcot) were never assumed, except that of *fear*, which was very vividly portrayed in her features and gestures.

A temporary spasm or paralysis of the vocal cords, lasting for some minutes, often followed an attack, causing hysterical aphonia. Patient was evidently distressed at not being able to speak, and tried to do so. Suddenly she gasped, said "That's it," and then she could talk freely. At other times a short period of ataxic aphasia followed the aphonia. Reflex action and sensation were abolished during the attack, and she was insensible to the strongest irritants. She had no recollection afterwards of what had occurred.

The invasions occur chiefly at menstrual periods, and on one occasion she had about twenty or twenty-five attacks in all during the day.

A temporary confusion followed, but no ecstasy, hallucinations, or stupor, succeeded the severer attacks.

During her illness she never presented the "attitude de crucifiement."

As regards the treatment, ovarian pressure in the case of M. M. did not appear to have much effect in shortening the epileptiform paroxysms, but it arrested at once the seizures of C. S. The nitrate of amyl suddenly arrested the convulsions, but when its administration was suspended they recurred, and the attack was only protracted. Metalloscopia was not fully tried, but copper, silver, and iron discs, applied to the anæsthetic surface for some time equally, caused a return of sensibility, which was limited to the area covered by the metals. Westphal has recorded several cases in which it has been used with success in the *Berliner Klinisch Wochenschrift*, No. 30, 1878.

The use of bromide of potassium was ineffectual, but considerable benefit was got from the monobromide of camphor and strychnine. Aloes and iron to restore the catamenial discharge were found useful, and when that function is thoroughly established, a favourable termination to both cases, as regards their severer features, may be looked for.

According to Burq's, Westphal's, Charcot's, and Reynard's experiments, sensation is restored to anæsthetic portions of the skin by he application of various metals, notably gold and copper; magnets, alvanism, and various irritants have a similar effect. The dministration of the metals internally does not appear to have been ully tried, except at La Salpetrière, where it is said to have acted eneficially; but the anæsthesia is apt to recur after another hysteri-al attack. The metallic discs so applied generate a galvanic urrent, which can be detected, and restores the sensation to the næsthetic portion of skin; or where the sense of colour, smell, or earing is lost, it is soon restored to its normal state.

It was found that the application of bone discs to hysterical patients often relieved the anæsthesia as much as the metal plates. This strongly suggested malingering on the part of the patients, but it has since been ascertained that in some cases of anæsthesia, the result of organic brain disease, chronic alcoholism, and lead poisoning, the loss of sensation was restored by the same means, and the benefit obtained was more permanent than in the hysterical cases (Dr Sturge, *British Medical Journal*, June 1878).

An interesting experiment regarding the hemianæsthesia was performed. On the left anæsthetic arm a mustard blister was tied, and removed some hours afterwards, when the *whole* arm was found to be hyperæsthetic, while the right arm, which was previously extremely sensitive, had become almost completely anæsthetic. This transfer of sensibility, or "phenomenon of transfer," as it is called by Westphal, only lasted a few hours, and the local benefit to the one side appeared to be purchased at the detriment of the other. The paralysis was benefited by the use of electricity, but the relief was only temporary, and it returned after the next epileptiform attack. As a rule, hysterical patients lose sensibility to pain, but retain tactile sensibility, and, according to Duchenne, in hysteric paralysis there is perfect electro-muscular contractility, with appreciable diminution or abolition of the electro-muscular and cutaneous sensibility.

Hystero-epilepsy has been regarded with some suspicion in this country, and the symptoms referred to duplicity and the result of "expectant attention." The psychical attitude of the hysterical frequently causes a tendency to the exaggeration of their symptoms, owing to some paralysis of their volitional control, and the emotional exaltation of the imagination, which find expression in ideomotor actions, such as the dramatic posturing and attitudes indulged in by hysterical girls. In more serious cases, in which hysteria is complicated by epilepsy, paralysis, catalepsy, etc., the mental disturbance is often not in proportion, and is secondary to the undoubted bodily disease. In such cases as in those related there is no reason to supect duplicity or malingering. There was an entire absence of motive to do so—indeed, a want of mental capacity to act or simulate such phenomena as those described. The patients are not the subjects of a "spiritual pathology," but of a bodily disease; and although some of the symptoms of hystero-epilepsy have been regarded with great scepticism, few who hav seen cases or read the graphic descriptions of Charcot can dou their reality. That the wonderful power of the mind over th body does induce such phenomena as anæsthesia and convulsion is known from accounts of the Dancing Mania of the 14th centur and other epidemics; but it is probable that a latter-day physici could differentiate between an epileptic and a "camp-meeting fi and that no effort of so-called "expectant attention" could induce a difference of some degrees of temperature between the two sides of the body. The mind may be possessed by a series of dominan ideas that regulate such attitudes as those described by Char which are truly automatic, and that take place without the "remembered consciousness of the agent," or self-deception on his par, especially when the exaltation of the religious sentiment, which s strongly tinctures the epileptic, hystero-epileptic, and catalepti is taken into consideration. Dr Howden pointed out that th devotional frame of mind in such cases was probably due to th enforced isolation of the epileptic child from the amusements a occupations of healthy children, while a craving for sympathy wa developed from the mysterious nature of the disease and the consciousness of helplessness. The strong hope the epileptic is endowe with finds a solace in its highest development—religion.

Howden Journal of Mental Science, Jan. 1873.—"Again when religious emotion develops itself in delusions, anoth element of character comes into play. Vanity and egotis give shape and form to his dreams and fancies. When cut off b sleep or epileptic trance from communication with the outer worl through the senses, the ever-waking mind operates on the stor which memory has hoarded, and works up those wonderful vision in which the most exaggerated egotism finds gratification in interviews with the Almighty, direct communications with the Saviour, or revelations as to the salvation of the human race."

It is unusual for hysteria to develop so suddenly as in the abov cases, and to run such an acute course. This variety of hystero-epilepsy may be classified as epileptic *petit mal,* engrafted on an co-existing with aggravated convulsive hysteria.

ARTICLE IX.—*Practical Observations on some of the more Common Diseases of Early Life.* By CHARLES BELL, M.D., Fellow of the Royal College of Physicians, Edinburgh, etc.

(Continued from page 245.)

WEANING.

THE period when the child should be weaned has given rise to a variety of opinions among accoucheurs, not only as to the age at which it should take place, but to the season of the year. Dewees,[1] when treating of this subject, has divided the seasons into convenient, inconvenient, and improper for this purpose. The convenient seasons are March, April, May, June, October, and the beginning of November; the inconvenient are December, January, and February, because the nights are long and the weather cold; and the improper are July, August, and September, as certain diseases are liable to appear and be aggravated by weaning. It may be advisable to attend to this arrangement in America, but there is no necessity for so doing in this country. It is very desirable, however, not to wean a child in the winter season, if possible, on account of the cold and the long nights. It is remarkable that the child generally cries little the first night of its weaning; the second night it is more restless and discontented; and the third night it cries a great deal. It is very difficult to explain why this should be the case.

THE CHOICE OF A NURSE.

When the mother's health or other circumstances render it necessary that a hired nurse should be employed, much care and observation are required in choosing one, as the child may imbibe disease from the milk of an unhealthy woman, or if the supply of milk be scanty, it may be imperfectly nourished. It is not always the largest breasts which yield the fullest or best supply of milk. The breasts, therefore, should be moderate in size, not loaded with fat; with a well-formed prominent nipple, from which the milk should flow easily, without always running out. Both breasts ought to be examined lest one should be imperfect or wanting. If possible, the nurse should not be engaged until she has got over the puerperal state, and the lochia have ceased to flow, lest the exposure and exertion of changing her residence should bring on any of the ailments peculiar to parturition. The milk should be thin and white, free from smell, and of sweet and pleasant flavour. There is a prejudice in favour of dark hair in the nurse, and that her skin should be clean and free from any kind of eruption. She should have a mild temper and not easily excited. The following lines clearly and concisely describe what a nurse should be:—

> "Choose one of middle size, nor old, nor young,
> Nor plump, nor slim her make, but firm and strong;
> Upon her cheek let good-humour show,
> Long arms, broad her chest,
> Her neck be finely turned, and full her chest.
> Let the twin hills be white as mountain snow,
> Their swelling veins with circling juices flow.
> Each in well-projected nipples end,
> And milk in copious streams from these descend.
> Remember, too, the whitest milk you meet,
> Of grateful flavour, pleasing taste, and sweet,
> Is always best; but if it strongly scent
> The air, some latent ill the vessels vent."[2]

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[1] *Diseases of Children*, p. 60. [2] *Pædotrophea*, as translated by Dr Tytler.

Great care should also be taken not to change the diet she has been accustomed to, as such a thing is often the cause of affecting her milk injuriously, and of inducing the flow of the monthly discharge—a circumstance which always tells upon the child by making it fretful and exceedingly pale, and often producing a disordered state of the bowels, the evacuations having a pasty appearance.

SLEEP.

The young infant when in health sleeps a great deal, which may be explained by its being easily fatigued, and requiring long rest to enable it to recruit its strength; and also by its being a wise provision for enabling it to pass the time in comfort until its mental and bodily faculties are sufficiently developed to enable it to enjoy and be amused by external objects. Dr Davis[1] gives a different explanation of this subject by supposing that the sleep is owing probably to its having been previously accustomed to it. But we have no means of ascertaining this fact; on the contrary, if we may judge from the general statement of the mother, the fœtus is rather a wakeful inmate, and it is not an unusual occurrence for it to deprive her of sleep by its active movements. This author also erroneously recommends that the child should not be allowed to sleep during the day, as it may prevent it sleeping during the night; he forgets, however, the old adage, "that one sleep brings on another." But while he lays down this rule he does not state how it is to be carried into effect. In opposition to this opinion, some authors consider that there is an intimate connexion between sleep and digestion, as that process goes on more actively during sleep. They therefore advise that the child should be allowed to go to sleep immediately after being fed. Sleep is considered so conducive to health in the infant, that it has been supposed by some authors that the sense of hearing is less acute in early life in order to render the infant less susceptible of being disturbed by sound.[2] But this is an error, as infants often waken in a fright when exposed to a loud noise. Too great sensitiveness to sound should not, however, be encouraged by keeping the nursery too quiet, as it is apt to be increased, and the infant may become so easily disturbed that the nurse walking across the floor may waken it. It should therefore be accustomed to sleep while the common occurrences of the nursery are going on. Dr Davis asserts that while some children are thus easily disturbed, there are others so drowsy in their nature, that were it not for the sense of hunger they would sleep for weeks.

When an infant has gone to sleep, it should be placed in the crib on its side, in order that the saliva may flow out of its mouth, and also because in that position it is less liable to pass water during sleep than when put on its back.

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[1] Davis's edition of Underwood.

[2] Maunsel and Evans, p. 70.

Some authors have objected to cradles because it is supposed that they are liable to produce disease of the brain; others, again, recommend their being used because they afford the kind of movement to which the child has been accustomed *in utero*.[1] It is a matter of little importance whether the child is put to sleep in a cradle or a cot; but it has been urged that it should lie on a straw mattrass, because it affords a firmer and sufficiently elastic bed, and from its cheapness it can frequently be renewed. This idea was very well in former times, before the discovery of waterproof sheeting, but straw seems to be a hard bed for an infant, and a hair mattrass is infinitely more suitable, and it can be readily protected by means of a mackintosh sheet. It ought frequently to be exposed to the air in order to keep it fresh and free from smell.[2]

The nursery should be kept of an equable temperature, and as near 65° as possible, for if it is much above this it is liable to produce irritability of the nervous system, which may lead to convulsions; and the sudden lowering of the temperature may give rise to other diseases not less fatal, such as inflammation of the lungs and air-passages. In addition to being kept of equal temperature, it should be well ventilated and free from draughts, and perfectly free from damp, which is a source of great danger to infants, as well as to the young of every other animal, although naturally of the hardiest disposition in more advanced age. Even the ass, when exposed to it, often dies of tubercular disease—a disease to which monkeys are also extremely liable under similar circumstances. The lambs frequently die when in damp situations.

EXERCISE.

It is necessary for the health of the child at all periods to have exercise proportioned to its age and strength. In very early life it should be of the most gentle kind, and so managed as not to frighten the child, otherwise convulsions, which are a most common consequence of fear, may be produced. The most suitable kind of exercise for an infant is gentle movement in the nurse's arms in the horizontal position, or to expose it before the fire, and rub its limbs and abdomen with the hand, by which the circulation is promoted and equalized. In carrying the child, and in moving it, care should be taken to steady and support the head, and give a feeling of security, otherwise it is sure to cry. It should never be allowed to sit up until it is six weeks or two months old, or until its head seems to be firm on its shoulders.

The precise time when a child should be allowed to walk will depend on its strength; but the longer this kind of exercise is delayed the better, for if the child is encouraged and tempted to do so, its limbs are liable to become bent, and it is certain to have many falls. It should therefore be encouraged to creep rather than to walk, as it is far more safe and conducive to health, because all its extremities are exercised at the same time, and it avoids the risks of falls.

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[1] Underwood, *op. cit.*

[2] Billard, *op. cit.*, p. 50.

Some children, however, are able to walk firmly much sooner than others. I remember seeing a girl walk firmly when she was only eight months old, but she was remarkably small and light in form.

THE EXPRESSION OF THE INFANT'S COUNTENANCE.

The countenance may truly be said to be the index or barometer of the child, as by its expression we are enabled to judge of the state of its health. Even during sleep it affords information which we can obtain from no other source. If the head is the seat of pain, the forehead will be contracted; if the stomach is affected, the upper lip will be elevated and the limbs will be drawn up; if the chest is affected, the nostrils are pinched and sharp; if the heart is affected and the circulation languid, there will be a dark circle round the mouth and eyes; when this hue extends over the whole face it is called the morbus ceruleus, indicating a malformation of the heart, as is illustrated by cyanosis; if the skin and the conjunctiva are yellow, it gives a sure sign that there is derangement or disorganization of the liver.

THE CRY OF THE INFANT.

Billard considers correctly that the expression of the countenance and the cry give the clearest manifestation of the sensations of the infant; but the cry does not always result from actual pain. It is the only means the infant has of making its wants known; hence it cries when it is hungry, sleepy, or wearied of being long in one posture, as well as from pain. There is, however, a difference in the sound of the voice when merely indicating its wants from that which is the result of pain and disease. It is, therefore, important for the mother or the physician to mark the distinction. If the child cries violently, and the tone of the voice is loud and free, it is a sign of health and vigour, and results either from hunger or temper. It ought not, however, to be allowed to continue lest it should end in convulsions. If the cry is weak and whimpering, there is strong reason to suspect that there is disease. The sound of the voice gives the clearest indication of the existence of croup, and enables the physician to distinguish it from any other disease of the chest or air-passages.

THE BREATH.

The smell of the breath deserves our especial attention, as it in many instances indicates the state of health of the infant, and may guide us in its treatment. In health the breath of the young infant has rather a pleasant odour, but in disease it often becomes ffensive. If the infant is suffering from diarrhœa, depending on cidity, the breath will have a sour smell; if there is an aphthous state of the mouth and gums, it will be fœtid.

We thus see that the circumstances which are liable to be overlooked or considered trifling by the ignorant and inexperienced are of great importance in the estimation of the observing and experienced physician, by enabling him to discover diseases in infancy, which could not be ascertained by the other physical means so valuable at a more advanced period of life.

Before entering upon the consideration of the diseases of early life, it is desirable that we should become acquainted with the characteristics and general appearance of the healthy infant at the full period of gestation, and with the terms used in early life.

The average size of the mature infant at birth is from eighteen to twenty-one inches in length, there being a slight difference between the sexes, the distinction of length being in favour of the male, in which the umbilicus is in general at the centre, while in the female it is a shade higher. According to Dr Elsbasser[1] the supra-umbilical portion is 9 inches 2½ lines in the male, and the infra-umbilical portion is 7 inches 9 lines, while in the female it is 7 inches 7 lines. The medium weight in this country, according to Dr Clarke,[2] is seven pounds; but on the Continent the average weight is much less. The robust infant cries almost immediately on coming into the world with a loud voice. It moves its limbs freely, and the surface of the body has a bright rosy hue. The mouth, nostrils, eyelids, and ears are quite open, the cranial bones are comparatively solid, and the fontanelles are not far apart, the "hair, eyebrows,"[3] and nails are fully developed, and the latter organs reach to the end of the fingers. When there is a defect in any of these particulars, and more especially if the child is unable to suck, there is strong reason to suspect that it is immature, and the chance of rearing it will be rendered very doubtful.

THE TERMS APPLIED TO EARLY LIFE.

Authors have differed materially on this subject. The term embryo is applied up to the fourth month of gestation by some forensic authors; after this period fœtus is used. At birth the period of infancy commences, and terminates at the twelfth month, when childhood begins, and continues until the eighth year, at which period the term of boy or girl is used until the age of puberty. Professor Traill[4] considers, however, that the term infancy should be used until the seventh year, when childhood commences, and continues until puberty, at which age adolescence begins, and is characterized by the appearance of the beard in the male, and the catamenia in the female. From this period till the age of twenty-one, the term youth is employed. This is a very fanciful arrangement, and is not generally adopted. In a legal point of view the term infant is applied until the period of majority, which is usually at twenty-one.

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[1] Churchill, p. 119. [2] *Op. cit.* [3] Churchill, *op. cit.*, p. 121.
[4] *Outlines of Medical Jurisprudence*, p. 17.

ISCHURIA.

This is one of the earliest diseases which attracts the attention after birth, and it is in general the first the accoucheur is called upon to prescribe for in the new-born infant. It is of two kinds, which have been distinguished, according to their cause, by the names of ischuria renalis and ischuria vesicalis.

Ischuria Renalis is the most formidable disease to which the infant is liable, but fortunately it is of rare occurence, as it indicates either the entire absence of the kidneys, or that they are seriously disorganized. If it comes on at a more advanced period, it may be the result of some accident, or of congestion, or be sympathetic of cerebral or spinal lesion; and if it does not soon yield to treatment, it is certain to run a rapid course to a fatal termination.

Treatment.—This will depend much on the apparent cause of the disease. If there is reason to suspect absence of the kidneys, all treatment will be in vain; but this state of matters cannot be discovered during life. If it is the obvious result of congestion, inflammation, or sympathetic of cerebral disease, the treatment should be such as is likely to remove such ailments; but the field of action is extremely limited in infancy. In former times, it was usual to rub the abdomen with a liniment composed of brandy, the oil of juniper, and of bitter almonds, or to apply a poultice consisting of marshmallow, parsley, cresses, juniper-berries, and garlic. But it will be found more useful to give mild aperients, as castor-oil, magnesia, or infinitesimal doses of calomel and James's powder, and to apply linseed poultices to the back; or flannel, wrung out of hot water, and covered with spirit of turpentine, may be applied to the back and stomach.

Ischuria Vesicalis, or retention of the urine. This, properly speaking, is a surgical disease, and if it does not yield to warm bathing it may require surgical interference, as it proceeds in general from inertia of the bladder, or some temporary interruption of the urethra. In the one case a small catheter may be introduced, and the urine drawn off; in the other, the plug of mucus which impedes the urethra may be removed with a probe.

CONSTIPATION.

This is a rare disease when the infant is suckled by the mother, because the milk which is first secreted after delivery is laxative and generally acts mildly on the bowels. Occasionally it happens, however, that the milk is astringent, rendering it necessary to give mild aperient medicine to the infant, or to induce the mother to take it herself, and at the same time so to regulate her diet as to effect a change in the character of her milk. This is infinitely preferable to having to give medicine frequently, because by so doing the system becomes so habituated to it, that the bowels will seldom be moved without it.

Constipation is rarely an idiopathic disease.[1] It occurs more frequently as a symptom of some other ailment, and the treatment will therefore depend in a great measure on the character of the primary disease; but it occasionally occurs soon after the birth of the child, when the meconium is retained, and is the source of great distress to the infant and anxiety to the mother. If the bowels are not freely moved within twenty-four hours after birth, it will be advisable to have recourse to a mild aperient.

Treatment.—When the meconium is retained beyond twenty-four hours, or if the mother's milk does not act sufficiently in cleaning out the bowels, a dose of castor-oil should be given, the ordinary quantity being a small teaspoonful, which may be repeated if necessary in four hours. It acts mildly, and in general does not produce exhaustion. When the meconium has been removed, and constipation occurs at a more advanced age, magnesia may be given with benefit, especially if the breath has a sour smell. When the child is obviously of a costive habit of body naturally, or if the mother's milk is of an astringent character, in place of constantly giving aperients, a lavement or a suppository may be administered with great advantage, as it generally acts quickly. If a lavement is to be given, it ought not to exceed an ounce to a new-born infant; for a child between one and five years of age, three ounces may be used; and in one from six to ten years, six ounces will be sufficient.[2]

(To be continued.)

Part Second.

REVIEWS.

The Transactions of the Edinburgh Obstetrical Society. Vol. IV. Edinburgh: Oliver & Boyd: 1878.

We wish to welcome this volume with peculiar heartiness, because it bears evidence of much stricter selection of papers for publication than was practised in its predecessors. All over the world these Transactions are esteemed and referred to; and we shall expect a continuance of their publication. Obstetricians will prefer to wait for a good substantial volume, instead of a publication hastened to a portly or sufficient size by mere windy padding.

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[1] West's *Diseases of Infancy*, p. 628.

[2] Pereira, vol. i. p. 150.

The Obstetrical Society of Edinburgh draws contributions to its proceedings from foreign as well as home sources; but it has to depend for its high character on the work and writings of its active members. It has always had eminent contributors to whom the world of obstetrics listens attentively; and this volume shows that new ones appear to fill the places that time renders vacant.

A volume of such varied contents scarcely admits of a reasoned criticism in a consecutive form. We satisfy ourselves with pointing to the greater papers in it. Not to notice the older hands who are still at work, we hail the increasing value and thoroughness and originality of Macdonald's. This volume inaugurates work of his on disease of the heart and lungs, complicating pregnancy and parturition, which has culminated in a separate volume, which will long be a book of reference on a new subject of intense interest and importance. We notice also work by Foulis, by Simpson, by Underhill, and an elaborate paper by Serdukoff of Moscow.

Distant physicians educated in Edinburgh regard with great satisfaction the rising of the new buildings of the Royal Maternity Hospital. There is a considerable distance between Lauriston and St Andrew's Square, but their proximity is such as to lead us to expect that the influence of the improved and enlarged hospital will be felt in the meetings of this vigorous Obstetrical Society.

A Handbook of Uterine Therapeutics and of Diseases of Women. By EDWARD JOHN TILT, M.D. Fourth Edition. J. & A. Churchill: London, 1878.

WHEN a book reaches a fourth edition it is a sufficient proof that it has supplied a real want, and may be held to show that the work is little dependent upon the judgment of the critical press.

We are glad to see the present manual in demand, for, though it is far from faultless, and is altogether somewhat old-fashioned in its drift and tone, its tendency is healthy, and it will help to discourage that meddlesome gynæcology which has wrought, and still works, so much evil to the female sex.

The book, strictly speaking, is not a treatise upon uterine therapeutics, but a series of dissertations upon uterine surgery and medicine, paying special attention to the treatment adopted in such cases.

After a general introduction, the author explains the various modes of examination of the uterus, and gives a description of the instruments employed as aids to diagnosis and treatment. Chapters on uterine surgery and medicine respectively follow.

A special chapter is then devoted to each of the following subjects, namely, Tonic, Sedative, Antiphlogistic, Caustic, Emmenagogue, Hæmostatic, and Specific Medication.

Then come chapters on the treatment of Uterine Displacement, of Complications, of Sterility, and on the Prevention of Disease n Women, and finally, a list of formulæ used by the author in his practice.

The subjects embraced within those wide limits are far too numerous for us to consider particularly in the space at our disposal.

We would simply content ourselves with drawing the attention of our readers to one or two leading points. The chapters on Uterine Dietetics and Tonics appear to us especially valuable. To judge from his article on Antiphlogistics, Dr Tilt seems rather fond of general blood-letting for our taste. It has always appeared to us that our professional ancestors made an egregious therapeutical mistake in practising general blood-letting so frequently as they did, and that, on the whole, it is better for us not to attempt to apologize for their practice, but frankly confess that they were mistaken, and avoid the practice, except in very special circumstances.

Though the drift of his observations on so-called ulcer of the cervix is healthy, he yet allows, we think, too great frequency and importance to this affection, not only in his remarks on this subject at the beginning of the special chapter devoted to Caustics, but in observations here and there throughout the work.

We are strongly impressed with the conviction, that it is the duty of every gynæcological author who would wish to influence the profession in the right direction, both from a scientific and therapeutical point of view, to be slow to allow the existence of ulcer of the cervix uteri. Ulceration of the cervix worthy of the name is undoubtedly a rare affection. It is, on the other hand, a very common delusion, leads to endless malpractice, and frequently causes irreparable mischief by diverting the practitioner's attention from the true pathological condition.

On the subject of uterine versions and flexions, Dr Tilt is, we are glad to find, strongly against treatment by intrauterine pessaries, or, indeed, by pessaries of any kind, until other measures are faithfully and fully tried.

But we must conclude. The book contains much valuable information and many excellent and wise suggestions. It is particularly useful also on account of the minuteness in matters of detail with which the regulations as to treatment are given.

We strongly recommend the volume to our readers as worthy of a careful perusal, and one of a kind specially likely to do great good to gynæcological practice at the present time, by its decided tendency to restrict the range of operative interference with the female genital organs.

The Mechanical System of Uterine Pathology. By Dr Graily Hewitt, F.R.C.P. London: Longmans, Green, & Co.: 1878.

Etude sur les Flexions de l'Uterus: Thèse presentés et publiquement soutenue à la Faculté de Médicine de Montpellier, le 14 *Août* 1878. Par Agnes M'Laren, née à Edimburg, pour obtenir le Grade de Docteur en Médicine. Montpellier: Hamelin Frères: 1878.

Study on the Flexions of the Uterus: Thesis presented and publicly sustained by the Medical Faculty of Montpellier, on the 14th of August 1878. By Miss Agnes M'Laren, native of Edinburgh, to obtain the Degree of Doctor of Medicine.

It is extremely difficult to pass an adverse opinion on the former of these works, for Dr Graily Hewitt is evidently in earnest, and fully possessed with the conviction that his views in regard to uterine pathology are correct. But we feel satisfied that in almost every essential his ideas are glaringly wrong, and would lead, if generally accepted, to the establishment of a most mischievous practice.

At page 3 of his book Dr Hewitt says—"It is high time that some more rational, intelligible, and generally comprehensible ideas on the subject of uterine pathology should prevail. Knowledge has, in this department of science, been defective." We reply, certainly, and with all the emphasis we can summon to the task, that the appearance of such a work as the present is in itself about the strongest proof that the above statement is true. It is certainly high time that more rational, intelligible, and comprehensible ideas should prevail than those which the author urges. It is also to our mind utterly incomprehensible that slight alterations in outline of a woman's uterus, which probably in a large proportion of cases were congenital, should ever give rise to the direst results to health of body and mind, including, for example, hysteria, convulsions, melancholia.

At page 5, we think, however, we find some explanation of the extraordinary position assumed by the author. He there says—"Early in my practice I was led to adopt the course of questioning patients closely in regard to their *sensations*. Coupling their statements with the results of careful internal exploration of the uterus and other adjacent organs, the result was in process of time to show such a close connexion between internal mechanical changes of the uterus and the existence of painful sensations, such as induced the patients to apply for relief, that I was insensibly led to attach the highest importance to this connexion."

It would thus appear that the author's mechanical system of uterine pathology had its origin chiefly in the sensations of his patients. We cannot help thinking that the substitution of the word sensational instead of mechanical would most fitly describe the system even in its condition of maturity. Indeed, it appears to us that instead of sifting with sceptical care the statements of his patients, as most gynæcologists do, Dr Hewitt must have allowed the pathetic assertions of his fair sufferers to utterly upset his better judgment. Such is the bewitching power of woman's wily tongue!

The frequency with which the author meets with uterine displacement in his practice is perfectly awful. In 620 cases examined by him at University College Hospital from August 1865 to December 1869 he states that no fewer than 60·8 per cent., or 377 in all, were cases of uterine displacement. This is certainly exceptional experience. But a little further on the author proceeds to give what he calls a definition of anteversion and anteflexion. That paragraph explains to our mind a great deal, and gives us to believe that little trust, indeed, can be placed in the author's observations regarding anteversions. We have read and re-read that paragraph, and have come to the conclusion, that to judge from it, at least, it is perfectly impossible to make out what the author means by an anteversion. Indeed, he makes no serious attempt at defining the lesion, the only indication of definition being that "the fundus should be readily or too readily touched when examination is made through the anterior wall of the vagina." As to anteflexion, we are apparently reduced to the inspection of a diagram, the author seeming to think that that is a sufficient definition.

We refer to these points because they show the serious amount of rashness of statement and want of accuracy in observation, which, we believe, explains in a great measure the extraordinary position which the author takes up on this subject.

We need not follow him into his account of the symptoms, and the results of uterine displacements. We merely state in passing that, his arguments notwithstanding, there is very good reason to hold that the great bulk of those disagreeable symptoms are explainable by reference to uterine and pelvic complications which are neither directly nor indirectly the result of the displacements.

But we do not mean to deny either the reality or importance of uterine displacements, especially those that take place backwards. Retroversion and retroflexion are often real evils, calling for treatment, and frequently yielding good results; often also they are temporary and unimportant. Anteversion, again, is, we feel certain, very seldom met with as a disease. Anteflexion, also, is, as a rule, of comparatively little importance, except when it produces mechanical disturbance of bladder functions.

The attempts to treat the symptoms arising in connexion with anteflexion by mechanical methods are, in our opinion, among the least successful of all the efforts of a meddlesome gynæcology. It is idle in the extreme to attempt to explain almost every case of dysmenorrhœa by a slight bend in the cervix, when we so frequently find a much greater degree of flexion without any such symptom. In our cases we have been usually able to discover some ovarian or other local or general explanation of the origin of the dysmenorrhœa.

Dr Graily Hewitt seems to regard anteflexion as a common cause of abortion. In this we cannot agree with him. Anteflexion, in our experience, is frequently associated with sterility, but we have seldom seen it lead to abortion, and we think further the belief that anteflexion is not a common cause of abortion commonly held by gynæcologists simply because it is the fact. As far as retroversion is concerned, we agree with Dr Hewitt in considering it as strongly predisposing to abortion.

The most redeeming feature of the work is the practical part. Dr Graily Hewitt apparently wants the courage to follow out his ideas to their logical limits, and consequently his practice is not nearly so objectionable as his theory. But bolder and less conscientious men taking up the same principles could not fail to be led by them to a treatment of uterine disease of a much more mechanical nature than Dr Hewitt recommends, and it is specially for that reason that we have spoken out so strongly upon the subject. But we are convinced that the influence of change in shape and position are grossly exaggerated by our author, and deem it greatly to be deplored that the influence of any gynæcologist of repute, such as Dr Graily Hewitt, should be directed in what we cannot help considering a most dangerous path.

Miss M'Laren's Thesis, on the other hand, treats the question very guardedly. It contains about the best *résumé* of the literature of the subject of uterine flexions which we have seen anywhere, and gives a curious insight into the oscillation of opinions and practice regarding them; it contains the results of extended observations made by the author in the hospitals of Rome, Florence, Marseilles, Lyons, and Paris, and is altogether a well-balanced and very complete essay on the subject. Miss M'Laren states that, out of 400 cases examined by her at these places, she could only find four cases of flexions—that is to say, flexions sufficiently pronounced to merit the name, and give rise to symptoms which required that they should be treated.

This extreme scarcity of these affections among hospital patients Miss M'Laren ascribes to the repugnance which she believes respectable females feel to apply for treatment at an hospital, which is at the same time a medical school. We think this may be partly true, but we also believe that uterine flexions are more common than is usually supposed, unaccompanied by symptoms, and are not complained of because they give rise to little or no trouble.

In 55 post-mortem examinations of young girls, Miss M'Laren found the uterus slightly bent forward, but normal in 51; in 11 cases it was found inclined slightly to the right, and 12 times to the left. But in only four of the cases were the organs really found in an abnormal position. In one of the four cases the uterus was in a condition of acute anteflexion, the body being completely bent upon the neck; in the other three cases the uteri were completely retroverted, the retro-uterine ligaments being greatly relaxed.

In regard to anteflexions, Miss M'Laren recommends sedative and tonic treatment, and wisely, we think, abjures all mechanical appliances.

In respect to retroflexions after subduing inflammatory complication, Miss M'Laren recommends the plan of treatment adopted by M. Courty of Montpellier, which essentially consists in a careful use of Simpson's intrauterine galvanic stem for a limited period. The bulb of the stem is kept back by filling the vagina with balls of cotton-wool steeped in glycerine. She believes this always ameliorates symptoms, and often effects a cure. We hope this is so, but think it presents a too sanguine view of the results of treatment. At least the experiences of Professor Courty is certainly superior to anything we have obtained by the same method. On the whole, the paper is a valuable contribution to scientific gynæcology, and will well repay perusal.

Lectures on Syphilis. By JAMES R. LANE, F.R.C.S. London: J. & A. Churchill: 1878.

THESE three lectures were delivered at the Harveian Society at the end of 1876, and have now been reprinted.

Lecture I. treats of the different doctrines promulgated since Hunter's time with reference to the contagion of syphilis, soft chancre, and gonorrhœa.

Our author is a unicist, and believes, along with Hutchinson, that the soft chancre is the product of syphilitic inflammation, but without, as a rule, containing the germ of syphilis. Surely it is easier to believe that the soft sore is *not* the product of syphilitic inflammation, when we so rarely find it followed by syphilis. Why should the product of syphilitic inflammation not generally contain the germ of syphilis? is a question difficult to answer, unless we accept Boeck's view, that the intensity of the soft chancre inflammation destroyed its syphilitic properties.

We endorse Mr Lane's opinion in regard to phagedæna, that it has no special relation to syphilis.

Lecture II. deals with the interesting subjects of the Contagion of Syphilitic Secretions and Blood, of Vaccino-syphilis, of Hereditary and Visceral Syphilis.

In summing up his remarks on the very moot point, whether a syphilitic father can infect the fœtus without first infecting the mother, Mr Lane says:—"There are, then, ample grounds for the belief that the ovum may be infected by the semen of the father, and equally so that the mother may be infected through the fœtus: and there is also good reason to believe that the complete escape of the mother, under such circumstances, is of exceedingly rare occurrence."

We believe that the mother of a syphilitic infant must always be syphilitic. Mr Lane refers to Collis' law, "that a mother never gets syphilis from her own infant," simply because she has it already. How does she become infected? *Directly*, by means of the syphilitic father's blood, which we know is contagious; or, *indirectly*, through the fœtus by means of the semen, a secretion, the contagious properties of which we are ignorant of. We strongly hold to the first or direct means of infecting the mother. During the intimate relations of married life, nothing is more likely than that at some time or other a minute portion of blood from a syphilitic husband should come in contact with an absorbing surface in the wife, thus producing infection in a manner easily understood.

Lecture III. is devoted to Treatment. This is the routine described by every author who believes in the beneficial effects of mercury, followed in the tertiary stage by iodide of potassium.

Mr Lane is a strong advocate of the Contagious Diseases Acts. These Acts, no doubt, lessen slightly the venereal disease in the army. They supply hospital accommodation for prostitutes on a scale which no private charity would attempt, and by means of the hospital many women are reclaimed. So much good we attribute to the Acts. Their worst feature is their repressive character, which is shown by the diminishing number of prostitutes in the towns under the Acts. We see these results in Paris, where the number of public women has steadily decreased under similar legislation, while the number of clandestine prostitutes has vastly increased. The Acts, in our opinion, will never succeed in lessening the amount of disease sufficiently to warrant the enormous expense necessary for their general application. These lectures are worth careful perusal.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D. Part IV. Philadelphia and London: J. B. Lippincott & Co. 1878.

THE favourable opinion we expressed in a recent number of the first three parts of Dr Duhring's *Atlas of Skin Diseases* is not belied by the present one, which has appeared at a reasonably short interval after its predecessors. The same care which characterized the earlier parts marks this, and the beauty of the letterpress fitly harmonizes with the very excellent chromo-lithographs which illustrate it. Four diseases are represented; all are eminently life-like, and bear the impress of having been drawn from typical examples. The first plate is devoted to vitiligo, and here the rarer case is chosen in which it occurs in a fair person, and where its special characters are more liable to be mistaken. Its value for diagnostic purposes is thus enhanced. The misplacement of pigment, which is the essence of the disease, is well brought out, the white, round, or irregular patch, with its more deeply pigmented margin shading off into the normal hue, is well shown. This is followed by a very artistically-drawn portrait of alopecia areata. Favus, a disease which is sensibly becoming of less frequent occurrence, takes up the third plate, while the fourth is devoted to eczema rubrum affecting the face of an infant; and is a most admirable picture of a too common disease, the distress of mothers anxious lest permanent disfigurement should remain, and a source of much trouble to the doctor, whose best efforts are often foiled till time cures spontaneously. So far as has been shown in the sixteen plates which have been published, there seems no difference between skin diseases as they occur in America and Great Britain—none, at least, at all comparable with the variations seen in many instances on the continent of Europe as contrasted with those met with here.

In the two pages of description, which accompany each plate, a clinical mode of treatment is adopted. After a short history of the particular case, the main features of the affection in general are sketched, and its nature and morbid anatomy briefly alluded to. The treatment pursued is given, but the result is not stated—an omission we regret; were this added, nothing would be lacking to satisfy the most captious.

The Antidotal Treatment of Disease. By JOHN PARKIN, M.D., Fellow of the Royal College of Physicians, Edinburgh; of the Royal College of Surgeons, London; of the Royal Med. Chir. Society, London; Corresponding Fellow of the Royal Academies of Medicine and Surgery of Madrid, Barcelona, and Cadiz, etc., etc. Part I. p. 307. London: Hardwicke & Bogue: 1878.

DR PARKIN is already well known as an able writer on various subjects of much importance to the profession and to the public. His works on Cholera, on Climate and Phthisis, on Gout, and on Epidemiology, are characterized by activity of mind, independent thought, learning, and cogent illustrations of those principles in physiology, pathology, and therapeutics, which the author advocates. We have studied his new work on the Antidotal Treatment of Disease, and regard it as a valuable contribution to medical science at the present time. We shall indicate two reasons for saying so:—

(1.) There is a tendency in these days to treat diseases empirically, rushing hastily from one supposed or lauded remedy to another, with little regard being paid to the principles on which they are administered—the mere name of an ailment being associated with certain medicines. Dr Parkin has no such infirmity. He is quite abreast of modern physiological research; he has carefully watched and pondered, during a long professional life, not merely the outcomes of morbid processes, but their origin and their courses, and if his treatment should appear too simple and too comprehensive in its applications to the modern mind of 1878, it has the recommendations in its favour of being suggested by sound observation and reasoning, of being supported by extensive analogies, and of being borne out by a large and varied practical experience.

(2.) Every observant practitioner must be struck with the remarkable manner in which, for some years past, the subject of *antiseptic* treatment has been coming to the front, not in its surgical applications only, but in the cure and the prevention of many of the diseases, indeed, nearly all to which the human frame is liable. Their name is legion, and it would be difficult to make a catalogue of these antiseptic agents: sulphur, turpentine, benzoin, carbolic acid, chloral-hydrate, salicine, pepsine, carbon, various hydro-carbons, Eucalyptus globulus, etc. Of course, many of these have been employed medicinally from time immemorial; but it is only of late that their antiseptic value has been realized, and not a few of them were employed on other principles and for other objects, until the keen eye of science recognised their new virtue, or at least explained their old usefulness. It would almost seem that a watchful Providence is bringing forward a wealth of antiseptic agents to meet the exigencies of our advanced modern civilization, and that, sooner than we expect, some mind of comprehensive insight will generalize our knowledge, and inaugurate a grand discovery, in whose light many therapeutic mysteries will be cleared up. In the meantime Dr Parkin has held to the conviction, for half a century, that carbonic acid is the antidote for *malaria*—the cause, as he believes, under modifying circumstances, of fever in its various forms, of cholera, and even of the *exanthemata.*

The book commences with an introductory chapter containing a luminous and really interesting history of medicine. It only occupies about sixty pages, but the reader feels that he gets an intelligent account of medical opinion from the earliest times, enabling him to enter into the thoughts, the theories, and even the erroneous practice founded upon these, of men who saw the same things that we see, but with the great disadvantage of comparative darkness. We may wonder at their apparent follies, but an unprejudiced consideration of their time and its surroundings will enable us to discover bright glimpses of truth, which even our vaunted modern science has hitherto neglected.

The next chapter, on the Physiology of Disease, is full of thought, and will repay a careful perusal. Having given an account of Claude Bernard's views regarding the vaso-motor nerves,—that there are two distinct classes, one supplied by the sympathetic, the other by the cerebro-spinal system — that these are antagonistic, the former being constrictors, the latter dilators—that it is always to a nerve of the cerebro - spinal system that, in accordance with present knowledge, we must refer the filaments which, in the different glands, preside over the phenomena of secretion and of dilatation,—he, Dr Parkin, offers an explanation of the phenomena witnessed during the febrile stage, as also in inflammation. We shall not go into the details of this explanation. It may be satisfactory to some minds and not to others. Neither shall we enter upon the *rationale* which he offers of the antidotal power of carbonic acid in febrile diseases. For these theoretical views we must refer our readers to the book itself. But as regards the successful results of treatment, particularly in ague, yellow fever, and cholera, we must say that Dr Parkin adduces a strong body of evidence, both from his own experience in Spain, in the West India Islands, and our own country, and also from the testimony of others. Both theory and experience have led him to administer his remedy during the period of intermission in agues, and as early as possible after the commencement of the attack in cholera and fevers generally. His mode of generating the carbonic acid is by means of half a drachm of bicarbonate of soda, with a scruple of tartaric acid, and he gives the draught in a state of effervescence. He would commence about two hours before the usual time of the accession in remittent fever, repeating the dose every quarter of an hour until four or five have been taken. As a rule, the patient escapes without experiencing any attack or the slightest indication of its approach. The remedy is repeated in the same way, or at intervals rather longer, for two or three days, when, as the disease is generally at an end, it is discontinued. Many of the cases detailed had previously been treated by quinine or bark for a considerable period.

It is obvious that, if *carbonic acid* generated in this simple way can be relied on, a very important discovery has been made at once in a therapeutic, an economical, and a fiscal point of view.

With regard to the mode of administration, a suggestion occurs which seems worthy of consideration. As the *carbonic acid* is the essential ingredient, and as it may in some cases be no easy matter to get a patient, prostrate and almost moribund, to be roused sufficiently to swallow such necessarily large quantities of fluid before the effervescence has subsided, would it not be better to give smaller doses, say ten grains of the carbonate and seven of the tartaric acid in solution separately? The chemical action would then take place in the patient's stomach, *all* the carbonic acid would be available, while, the quantities being comparatively small, the sudden escape of gas would not cause undue distension or disturbance.

There is always some risk of an idea, good in itself, being ridden to the death; and we are of opinion that Dr Parkin may be too sanguine in some of his anticipations regarding the use of his antidote. But we cordially recommend his book as a performance of great merit, and we shall expect much information from Part II when it appears.

Clinical Manual for the Study of Clinical Cases. Edited by JAMES FINLAYSON, M.D. London: Smith, Elder, & Co.

IT has at last dawned upon the professorial mind that for the purpose of educating the embryo practitioner in clinical work something more is needed than a rapid gyration round a medical ward at the head of a motley mob, or the dealing out of scraps of systematic knowledge on the patient's disease, under the delusion that this is clinical instruction. As the outcome of this discovery, we have had the tutorial classes, long established in the Edinburgh University, coming more into vogue throughout our medical schools; and as a result of such, this praiseworthy *Clinical Manual for the Study of Clinical Cases* has been sent out by some of the teachers in the Glasgow school.

It is well to know that there are some things that a medical student can be taught, and some that he cannot. During his student life he can only be shown the best way to investigate disease, and the principles underlying the methods so used; and this can be enforced by the display of typical cases. It is this clinical "seed corn" that he bears away in greater or less quantity, according to his diligence and opportunities, when his *alma mater* sends him from her portals qualified, legally at least, to grapple with disease.

The manual now under consideration has been published in order to facilitate and systematize the student's clinical studies, and the production of such a work is a decided step in the right direction.

The five gentlemen whom Dr Finlayson has associated with him have each taken up the consideration of the part that they were most fitted to treat of—a better arrangement than if the entire work had fallen upon one writer. The result is, on the whole, good, although patchy and unequal.

The first chapter, by Professor Gairdner, on the Physiognomy of Disease, written in his usual genial style, is valuable from its suggestive character. The student, in addition to learning a good deal from it, will find himself stimulated to observe for himself and to store up much knowledge concerning physiognomical diagnosis, incommunicable to any one, but which will be of use as a help in the recognition of many cases.

The chapters which follow on Temperature, Pulse, Examination of the Skin, of the Organs of Special Sense, and so on, are good and useful. The section on the sphygmograph is meagre in its statements, and wants entirely any explanatory text. Thus, the student is simply told what are the chief parts to be recognised in a pulse tracery; but what is the cause, so far as is known of the various waves, is not stated. The student accordingly cannot fully appreciate the force of a "dicrotic pulse tracing," seeing that the cause of the normal tidal wave is not given.

We are disappointed with the section on the circulatory system. We expected that the part allotted to cardiac murmurs would have been the best in the book, considering that it has had the benefit of Professor Gairdner's supervision.

The chapter on the normal sounds of the heart is by no means full, and omits one important fact at least, to say nothing of the omission of all reference to the cause of the sounds. The important fact omitted is, that previous to the ventricular contraction the blood is flowing quietly from the auricle into the ventricle. As we shall afterwards see, this fact explains the so-called "ventricular-diastolic murmur" following the second sound.

The nomenclature adopted is confusing. Thus, "auricular systolic," "ventricular systolic," and "ventricular diastolic," are the general terms employed. The "auricular systolic" murmur, however, is also a "ventricular diastolic" one, so that the terms lack precision.

Then, again, all murmurs are said to run "up to" or "off from" the various sounds, never to replace them. Of course the presystolic murmur runs up to the first sound; but so far as hearing is concerned, the "aortic regurgitant and mitral regurgitant murmurs," for example, *replace*, as a general rule, the second and first sounds respectively.

As the result of all this confusion, we get murmurs associated in terminology which are entirely different in causation. A notable instance of this is seen in the description of the so-called "ventricular diastolic" murmur. Under this term there is comprised the well-known aortic regurgitant due to deficiency of the semilunar valves, so that we get a murmur replacing the second sound. The other murmur given is said to follow the second sound, and to be due to blood passing from the auricle. It is really caused by the blood flowing through a stenosed mitral orifice, previous, as we have already said, to the real auricular systole. It is never a loud murmur, and as it occurs during the formation of the second sound, the latter obliterates, so far as hearing is concerned, the first part of the murmur,; and, accordingly, it seems to follow the second sound just as it would seem to follow the cessation of any other loud noise made in its vicinity. It is therefore a presystolic murmur, and should not be associated with the aortic regurgitant at all.

By far the most unsatisfactory and meagre part of this manual is the section on disorders of the female organs. It is, indeed, difficult to see on what plan Professor Stephenson has proceeded. The diagnosis of pregnancy is considered before any description of "pelvic examination" is given, so that the student is supposed to make a vaginal examination before he is told how to do it. The remarks on the diagnosis of pregnancy are vague. It is quite true that "the diagnosis of pregnancy in the earlier months is difficult." It is not impossible, however. At the second month a careful bimanual examination will reveal a quite distinct enlargement of the uterus; and this, associated with sudden amenorrhœa for two months, will, in the great run of cases, lead to the discovery of the woman's true state. There is nothing more culpable, and yet more common, than deferring the anxieties of an unmarried woman until the pachydermatous tympanum of the practitioner vibrates to the fœtal heart. If he practises a careful bimanual in all his pelvic examinations, he will soon know an unimpregnated uterus from one at the second or third month of pregnancy, and thus rise above the level of a "midwife." The most serious faults are, however, in the description of a pelvic examination. Many valuable cautions are omitted, and a good many unnecessary ones put in. Thus the student is told that when he introduces his finger into the vagina, the "perineal and vaginal constrictors will contract slightly, but will soon again relax." Apart from this unnecessary parade of doubtful anatomy, it is in reality a good maxim for the student to keep in mind, that if he feels any such muscular contraction, the sooner, for his own reputation and his patient's modesty, he withdraws his finger the better. After overcoming this spasm, however, he is next told to note various points about the cervix, as if observations on the vaginal walls were of no use, and vaginal fistulæ and tumours quite beneath his notice. He is then informed that fæces in the rectum will give a feeling of resistance in the posterior wall. We thought hitherto that one diagnostic of fæces was their pitting on pressure; but we are always learning in this world. It is too bad, however, for the writer to ignore the fact that the rectum passes to the left side, as well as to dismiss the important method of bimanual examination in four and a half lines, ending with the remark, that "in this manner the size and position of the uterus may be determined."

The practical instructions for passing the sound are about the worst possible. Too little stress is laid on the previous moulding of the curve of the sound to that of the uterine cavity, and the student is told not to use it if there is a suspicion of pregnancy, whereas he should never employ it if the woman has passed even one period. Then it is certainly better to pass the sound with the left hand and not with the right; and only to pass it after a careful bimanual examination is made. This last most important point is never mentioned indeed. Finally, the diagnostic value of the sound is understated, and some methods of employing it, hardly suitable for students, advised.

We could in the same way show that the directions for the introduction of the speculum are even worse than those for the sound; but to point out all the errors in this section would ncroach too much on space and patience. If it were re-written y a conscientiously contradictory critic, it would be a really aluable part of the book. We are sorry that this most important ranch of the student's knowledge is so imperfectly gone into. he other sections on Insanity, the Nervous System, Respiratory ystem, etc., etc., are all excellent, and will prove of great value to he student. In a work like this, where so many writers have ad a share, equality of excellence is not to be expected; but we an honestly say, that most of it is as much above the average as he rest is below, and that the student will find the former of the tmost help to him in his ward work.

Sore Throat, and its Nature, Varieties, and Treatment. By PROSSER JAMES, M.D., M.R.C.P. Third Edition. London: J. & A. Churchill.

A WELL got up little volume, the last edition of which was published in 1865, this one being delayed owing to the illness of the author.

The first chapters treat of the nature and varieties of sore throat, their diagnosis and treatment.

When describing remedies, Dr James enlarges on the use of aconite, on the whole, we are inclined to think, a little egotistically; notwithstanding which, many good and useful hints to the practitioner will be found under the heading of treatment.

In dealing with croup and diphtheria, chap. ix., the author does not allow of the anatomical differences between these diseases which the general school of pathologists so strongly adhere to at the present day.

Dr James evidently feels aggrieved at the manner in which some of his therapeutic proposals have been met, and the acceptance these identical methods of treatment have received, especially when hailing from Germany; *e.g.*, when writing of the use of steam inhalation in throat diseases, accompanied by exudation, we find the following:—"I ought perhaps to feel the more satisfied, since this is only one out of several instances in which my teaching has passed over to Germany, and having there received what we must perhaps call the official stamp of this generation, has been afterwards adopted at home."

The latter portion of the book treats of the soft palate, tonsils, pharynx, and larynx—the latter, however, by no means fully.

On the whole, although there is much good material in the work, there is not much really new; nor perhaps could we hardly expect otherwise, inasmuch as the author is constantly pointing out—rather too frequently, we think, for pleasant reading—how he had recommended or urged the use of such and such a mode of treatment twenty years ago.

Accompanying the letterpress is a set of twelve lithographic illustrations of laryngeal disease, by no means the worst part of the work.

Domestic Medicine and Hygiene; being a Short Account of the more Common Diseases, their Causes and Treatment, written in plain language. By WILLIAM J. RUSSELL, M.B. London: W. H. Everett, 34 Bouverie Street. 1878. Pp. 411. Duodecimo.

THIS small volume contains a great deal of matter, well digested and carefully put together. We have examined it with some care, and consider it a trustworthy guide to those who are far from medical advice, and thrown, for the time, on their own resources. But, as is almost inevitable, some things are absent which might have been in it, and others admitted which might safely have been left out. We quite admit the propriety of reserving syphilitic and other affections of the same category for a separate appendix; but there is no reason that we see for excluding the ordinary complaints peculiar to women. On the other hand, *locomotor ataxy* and *progressive muscular atrophy* are not affections which are either likely to occur or to be satisfactorily treated at a distance from skilled professional advice. The last remark is applicable to some diseases of the eye, which ought certainly to justify a long journey under difficulties to the nearest seat of reliable skill. The danger is that persons reading a book like this may conceive themselves competent to deal with cases which demand a complete medical education and the experience of years—illustrating the wise saying, that "a little knowledge is a dangerous thing."

While commending the author for the merit of his book, which is very considerable, we must demur to his remark, that "at present there seems to be no simple reliable handbook of medicine for ordinary use," because we cannot imagine any book of the kind superior to that which bears the honoured name of the late eminent and judicious Dr James Warburton Begbie.

Part Third.

PERISCOPE.

MONTHLY RETROSPECT OF OBSTETRICS AND GYNÆCOLOGY.

BY ANGUS MACDONALD, M.D.

REPOSITION OF THE INVERTED UTERUS.—In the October number of the *New York Medical Journal*, Dr J. Byrne describes an ıstrument by means of which two cases of chronic inversion of the .terus had been successfully treated. The apparatus is made up f a cup-shaped part which receives the inverted uterus per 'aginam, provided with a movable bottom which, during the eposition, is made to pass upwards by means of a screw, so that ontinuous and ever-increasing and steady pressure is made upon he inverted fundus. The uterus is at the same time steadied by an ıbdominal plug carefully applied to it so as to act in opposition o the intra-vaginal plug, and exert counter extension. In two ases reported the arrangement gave excellent results The operation in both cases was managed by Dr Gaillard Thomas.

Method for Controlling the High Temperature after Ovariotomy is the subject of a paper in the August number of the same journal. The method meant is cold affusion practised after a peculiar fashion by means of Kibbee's fever cot. The peculiarity of this cot is given in Kibbee's advertisement thus:—"The bed on which the patient lies consists of a strong elastic cotton netting, manufactured for the purpose, through which water readily passes to the bottom below, which is of indiarubber cloth, so adjusted as to convey it to a vessel at the foot." When not in use it can be closely folded so as to occupy but little space when affusion is to be practised. Dr Thomas recommends a folded blanket to be placed on this bed to prevent the patient's body from being cut by the netting. The head is to be placed on a pillow covered with indiarubber cloth, and a folded sheet is laid across the middle of the cot, about two-thirds of its extent. The patient is now laid upon the bed, her clothing lifted up to the arm-pits, and her body enveloped in the sheet. The legs are covered with flannel drawers and the feet with stockings, whilst hot bottles are placed at the feet. The physician then pours a large pitcher of water over the sheet, and covers up the patient with two dry blankets. The patient is thus enveloped in a wet sheet, covered with dry blankets, with hot bottles at her feet; the portion of the thorax above the shoulders and also the lower extremities are, of course, quite dry. The result of the affusion is tested every hour by the thermometer, and, if the temperature has not fallen, another affusion is practised, and this process is kept up till the temperature comes down to 100° or less. After this temperature has been attained, four or five hours will pass ere the affusion requires to be repeated. Eight cases are recorded by Dr Thomas, seven being cases of high temperature after ovariotomy, and one in consequence of pelvic peritonitis. Of these eight, six recovered, and two died. But in all the effect of the affusion in lowering the temperature was very marked. In concluding his paper, Dr Thomas says—"Only one point is fully proved by it, that is, the efficacy of cold affusion in controlling the high temperature developing after ovariotomy. That by it peritonitis or septicæmia is absolutely checked, I do not claim. That their courses are by it robbed of much of their destructive tendency, I trust I have demonstrated, as far as demonstration is possible, from so small an exhibit of cases."

MILK FEVER is the subject of an interesting paper by Dr Macan of Dublin, in the *Dublin Medical Journal* of May last. The author gives first a *résumé* of the history of opinion regarding milk fever, which he follows with a statement of the results obtained by him from the observation of 446 cases, and formulates the following conclusions:—1. There is no rise of temperature necessarily accompanying the first secretion of milk. 2. Pain and distension of the breasts may cause fever; but this fever differs greatly from that generally described as milk fever. It comes on somewhat later, and lasts much longer; for while milk fever is said usually to terminate in from 8 to 24 hours, this fever, in 65 per cent. of the cases, lasts more than 24 hours, and does not, I think, so frequently terminate in profuse sweating. 3. The pulse in these cases is often slower than the temperature would seem to warrant. 4. In cases of milk fever during the puerperal state the presence of full breasts is not sufficient justification for at once diagnosing the case as one of milk fever. Ephemera, weed, miliary fever, and the severe forms of hydrosis of Blundell, Dr Macan regards as various expressions of surgical fever or of septicæmia

OVARIOTOMY BEFORE AND AFTER ANTISEPTICS is the subject of a paper of extraordinary merit, by Dr Thomas Keith, read at the East Surrey District Meeting of the South-Eastern Branch of the British Medical Association, 10th October 1878, and published in the *British Medical Journal* of 19th. Oct. His principal conclusions in regard to the advantages derived from antiseptics in ovariotomy are as follows:—

1. Antiseptics have lessened the mortality of the operation. In Keith's last 43 cases there was not a single death. Since the Germans commenced antiseptics they have reduced their mortality from 50 to 20 per cent.

2. The increased safety will encourage medical men to recommend earlier operation.

3. The drainage-tube will not be so frequently required, and that source of additional risk will be lessened.

4. The convalescence is rendered easier by them.

5. Antiseptics are a great comfort and relief to the operator.

COPEMAN'S TREATMENT OF VOMITING DURING PREGNANCY.—In the June number of the *Archives de Tocologie*, there is contained an account of the successful treatment of a case of severe uncontrollable vomiting during the third month of pregnancy, by Dr Murillo, of the Maternity Hospital of Santiago. After the ordinary methods had proved unavailing, Dr Murillo passed his finger along the cervix up to the inner os, according to Dr Copeman's recommendation. Some improvement followed the first performance of the manipulation. The repetition of the same operation four times at

ntervals of two days issued in enabling the patient to digest her ood, and to reach the end of her pregnancy in safety.

THREE FATAL CASES OF BATTEY'S OPERATION are recorded by Dr Engelmann of St Louis in the *American Journal of Obstetrics*, of July 1878.

The cases all presented the greatest urgency. The first patient died of inanition and inability to overcome the shock of the operation.

The second, a mulatto, with feeble power of resistance, succumbed to a moderate attack of peritonitis.

In the third case the operation was tedious and severe, and the patient much weakened by hæmorrhage.

Dr Engelmann then gives an analysis of 47 recorded cases of Battey's operation with these results. There were cured, 9=20·93 per cent.; greatly improved, 6=13·95 per cent.; somewhat improved, 5=11·62 per cent.; not improved, 5 11·62 per cent.; made worse, 3=6·98 per cent.; died, 14=32·45 per cent.; survived, 29=67·44 per cent.

Dr Engelmann considers the operation a feasible and proper one in suitable cases, but regards it as decidedly dangerous, and says—"The operation is indicated only in certain cases of chronic uterine or ovarian disease, accompanied by intense suffering or uncontrollable reflex symptoms, in which all means of treatment in the hands of competent physicians have failed, so that the unhappy patient must drag out the miserable existence of a helpless and constantly suffering invalid, if she does not lose her reason or succumb to the tortures of disease; it may then be undertaken—(1) in order to establish the menopausis, or (2) to remove the offending organs; frequently for both purposes.

He recommends to operate by abdominal section, except when they are displaced upon the vagina. He thinks both ovaries ought to be removed in every case.

He strongly supports Battey's claim to be regarded as the real author of the operation, repudiating that of Hegar of Freiburg, who he affirms performed it once, but unsuccessfully, a short time previous to Battey's first case, but who did not publish any account of his unsuccessful attempt, nor attempt to operate again till four years later, after a large number of American surgeons had repeatedly practised it.

ON A NEW FORM OF LONG FORCEPS, WITH REMARKS ON THE THEORY OF THAT INSTRUMENT IN GENERAL, is the subject of an interesting paper in the *Glasgow Medical Journal* for June 1878 by Dr William L. Reid.

Dr Reid objects to the varieties of the long forceps at present in use, because they do not pull directly in the axis of the pelvis when the head is at the brim, and consequently expend a certain proportion of the operator's force in exerting injurious pressure against the symphysis, because it is impossible to judge accurately of the direction in which the instrument is moving when the hand is high up, and because if they are made straight they are apt to slip and also to tear the perinæum, whilst if they have a pelvic curve they are incapable of being used as rotators without injuring the soft parts. To remove these deficiencies, Dr Reid, after many trials, has invented a forceps with the lock looking anteroposteriorly, so that the one blade is applied in front and the other behind the head; and, at the same time, a large perinæal curve is given to the shank of the instrument—the perinæal curve being in the opposite direction to the pelvic curve of the blades. The handles are so arranged as to lie in a continuation of the axis of the blades when the instrument is worked, so that the direction of the handles always indicates exactly the direction in which the head is moving.

A drawing of the instrument accompanies the paper. The apparatus appears extremely clumsy, but Dr Reid insists that he obtains splendid results from its employment.

Dr Christie of Carrigart, Donegal, communicates a paper in the same *Journal* in explanation of another form of long forceps which he has invented. The merits of this instrument appear to us doubtful.

Spontaneous Reduction of an Inversion of the Uterus of Four Months' Standing by means of an Intra-Vaginal Globular Air Caoutchouc Pessary after Eleven Hours. — Professor Courty — *Annales de Gynécologie* of October last —relates a case of this kind. He maintains that the elastic pressure of the air pessary is the most physiological method of attempting to cure this very troublesome affection, inasmuch as the gradual pressure against the constriction at the inner os, exerted by the everted uterus when the fundus is pressed by the air-ball, exactly imitates Nature's method of dilating the inner os before delivery, only that it acts in the reverse manner. He, however, grants that certain patients are so constituted as to be unable to bear this method.

He recommends the treatment of chronic inversion to be conducted on the following principles:—

1. It is necessary to stimulate the spontaneous reduction of uterine inversion by continuous pressure, with the aid of an air pessary in the vagina. If there are adhesions so serious as to render reduction impossible, or if the patient cannot bear the pessary, success cannot be expected. This method ought always to be tried, however. He thinks reduction may be expected from the tenth to the fifteenth day.

2. In case this method is not successful, or is not supportable by the patient, he recommends to effect the artificial reduction by the taxis aided by chloroform, and, in case of need, by incision, keeping back the neck by the aid of two fingers of the hand, which does not push up, introduced into the rectum and bent as a hook (over the upper portion of the uterus). In this way counter-extension, he holds, is completely and safely effected.

3. If we cannot reduce the womb, it is necessary to cause it to fall off by means of the elastic ligature. This latter process Professor Courty prefers to any of the other more common methods.

He recommends a furrow to be burnt round the organ immediately outside the cervical constriction. Then he draws a strong caoutchouc thread round the uterus, keeping it in this furrow, and ties the two ends tight with well-waxed thread. This elastic ligature he permits to gradually work its way through the uterine tissues, and states that the process is usually finished by the twelfth or fifteenth day. Detergent and disinfectant injections are meanwhile to be carefully employed.

MONTHLY REPORT ON THE PROGRESS OF THERAPEUTICS.

By WILLIAM CRAIG, M.D., F.R.S.E., Lecturer on Materia Medica, Edinburgh School of Medicine, etc., etc.

MACROTIN.—Macrotin, a resinoid obtained from the *Cimicifuga racemosa*, is highly recommended for facilitating parturition; when taken for a month or two before confinement it is said to render the labours easier than they otherwise would be. Probably the fluid extract of *Cimicifuga racemosa* would fulfil all the indications unless there should be found another principle that would be contra-indicated.—*Detroit Lancet*, September 1878.

OXALATE OF CERIUM AND CAFFEIN AS PREVENTATIVES OF THE NAUSEATING EFFECTS OF OPIUM.—To Professor De Costa is due the credit of having first suggested the combination of bromide of potassium with morphia to obviate the disagreeable after-effects which so frequently distress patients to whom morphia has been administered. It frequently happens that the potassium salt cannot, in consequence of its bulk and unpleasant taste, be employed. Especially is it objectionable when the practitioner prefers to use opium either in the form of a pill or powder; nor is its therapeutic effect always desirable. To meet these objections, I have for some time past combined the oxalate of cerium with opium, and have in a great many instances found it equally efficacious in obviating the nausea and mitigating the distressing after-effects. Sir James Simpson introduced the oxalate into use as a now valuable agent in relieving the nausea and vomiting of pregnancy. Since then its employment has been very widely extended, and it has become quite common to combine it with drugs and to secure their tolerance by the stomach. For a long time I have been accustomed to prescribe a strong decoction of coffee, without milk or sugar, in drachm doses, administered every fifteen minutes, to relieve the nausea and headache following the employment of opium. Since the introduction of the effervescing citrate of caffein, I have found it a very agreeable and efficient substitute for less palatable beverages. These agents are, however, only applicable after the occurrence of the stomachic disturbances. The citrate of caffein, though less efficient than the oxalate of cerium, may be combined with opium. It is inadmissible in those cases where opium produces wakefulness instead of drowsiness. I have sometimes fancied that it lessened the soporific, without affecting analgesic, properties of opium. It may be that these applications of drugs are quite common; but if they have been previously published, it has escaped my observation.—Samuel C. Busey, M.D., Washington, D.C., *American Practitioner*, September 1878.

IODOFORM.—Dr Moleschott of Turin writes that he has used iodoform with success in cases which have been usually treated by iodine ointment, such as glandular swellings and cold abscesses. He mentions a case of enlarged spleen, with great prostration, pallor, obstinate diarrhœa, swelling of the lymphatic glands, and increase of the white blood-corpuscles (1 to 50 red), in which very favourable results followed the painting of iodoform collodion over the spleen and lymphatic glands. Not less successful was its application in orchitis and epididymitis, and also in exudations into serous cavities, even including hydropericardium. He advises that iodoform collodion should be tried before paracentesis whenever removal of watery effusion is necessary. He has cured five cases of acute hydrocephalus by the application of this remedy several times daily, calomel and purgatives being, however, given at the same time. In cases of swelling of the knee-joint, where surgical interference appeared unavoidable, perfect recovery followed the prolonged local application of the iodoform. Apart from its action as a resolvent, iodoform has the property of relieving pain; Dr Moleschott hence recommends its use in painful attacks of gout and also in various forms of neuralgia. In a case of intercostal neuralgia he gave it internally in the form of pills (three-fourths of a grain daily), as well as externally. In severe neuritis he has used iodoform collodion successfully after other treatments had been tried in vain. Administered internally, it will probably be useful in the palpitations of nervous and hysterical patients, and will restore the regularity of the heart's impulse. Its offensive smell is obviated by mixture with tannin (*Giornale Internationale delle Scienze Mediche*, Nos. 5 and 6. 1878).—*British Medical Journal*, September 1878.

ACTION OF SALICYLIC ACIDS AND THE SALICYLATES.—Chrone and Petrucci have made a series of experiments on these remedies, and have arrived at the following conclusions:—Both salicylic acid and the salicylates have the same biological action, but with the first local, with the latter general conditions are of most importance.

Salicylic acid, both free and as a salt, lowers, in small doses, the temperature, though not to any great extent. In large doses it not only does not depress it, but it actually augments it to a very marked extent.

Animals submitted to the daily consumption of the acid or of its salts, become rapidly thinner, and lose weight. The beats of the heart in the frog are increased in frequency after the use of salicylate of soda, but in animals they are sometimes reduced, sometimes increased in frequency, apart from the absolute dose administered; but with salicylic acid the frequency of the beats is always reduced. Lastly, salicylic acid constantly diminishes the frequency of the respirations, whilst salicylate of soda first augments and then reduces them (*Commentario Clinico*, Pisa, No. 14, 1878).—*The Practitioner*, November 1878.

SODIC SALICYLATE IN DIABETES MELLITUS.—Ryba and Plummert have reached the following conclusions: (1.) In daily amounts of two drachms, it determines a decided diminution in the amount of sugar excreted. (2.) The best results are to be obtained in the more recent cases. (3.) The above diminution may be made more striking by restricting the hydrocarbonaceous elements of the diet. (4.) The polyuria usually yields consentaneously with the glycosuria. Other diabetic symptoms (*e.g.*, bodily weight) are favourably influenced. In two cases the symptoms were at first aggravated, but soon yielded under this treatment (*Prager Med. Woch.* — *Chicago Medical Journal*, June 1878). — *Detroit Lancet*, Oct. 1878.

SALICYLIC ACID IN YELLOW FEVER. — Dr Hartwig Bünz, of Savannah, finding that the ordinary method of treatment of yellow fever by emetics and purgatives was of no avail during an epidemic at Georgia in 1876, had recourse to salicylic acid, as the fever was of an intermittent type. Good results were obtained by administering the salicylic acid in doses of one drachm and a half for adults, given in solution, in capsules, or with sugar. In cases in which the stomach rejected the acid, three drachms were given by the rectum. Patients treated in this way suffered much less from pain in the spine and limbs than those treated with quinine; the temperature, which was ordinarily 104° to 106° F., fell to 100° to 99° F., and the pulse from 120 per minute almost to the normal. Dr Bünz believes that salicylic acid is the most powerful antipyretic against yellow fever of the intermittent and remittent type; he has not tested its value in cases of the continuous form, interesting as this would be, for over them quinine exercises no perceptible influence (*Berliner Clin. Wochensch.*, 2d Sept. 1878).—*The Practitioner*, November 1878.

THE ACTIVE PRINCIPLE OF ERGOT.—Theodor Blumberg, in an inaugural dissertation published this year at Dorpat, alludes to previous researches into the active constituents of ergot. Recent investigation had shown this to be extracted by water, but to Dragendorff and Podwissotzky belongs the credit of having isolated the active principle, which is an acid. Earlier investigations had shown the existence in ergot of alkaloid substances. Wensell found, in 1865, two amorphous alkaloids, one of which he called ecbolin, and the other ergotin. In 1875 Tauret described a crystalline alkaloid, to which he gave the name of ergotinin. Two years later Podwissotzky found an alkaloid substance as an admixture of the sclerythin, which was distinguished by its active physiological effect. This received the name of picrosclerotin. Blumberg has endeavoured to ascertain whether the substances called by Wensell ecbolin and ergotin are individuals, or whether they are one and the same alkaloid. In addition, he has tried to find some method of obtaining picrosclerotin in large quantity, and of isolating ergotinin. With regard to the first of these points, after considerable investigation, full details of which are given in his dissertation, Blumberg expresses the opinion that ergotin and ecbolin represent one and the same alkaloid. He also gives at length the methods employed to obtain picrosclerotin and ergotinin, both of which are very easily decomposed.—*Medical and Surgical Reporter*, October 1878.

MODE OF EMPLOYMENT OF EXTRACT OF ERGOTIN IN HYPODERMIC INJECTIONS.—The solution recommended is so concentrated that one gramme corresponds to two of the powder, and is said to succeed well. It does not irritate the subcutaneous connective tissue, and forms neither eschars nor abscesses. Administered in this mode the stimulant action of ergotin over the uterus is most marked and persistent. It has been found useful in cases of severe hæmorrhage from the lungs, as well as from the uterus (*Imparziale*, No. 9, 1878).—*The Practitioner*, November 1878.

TREATMENT OF NEURALGIA BY HYPODERMIC INJECTIONS OF ERGOT.—Marino recommends the injection of from 0·15 to 0·25 gr. dissolved in six grains of distilled water. This may be repeated once or twice, though perhaps not more than six times, and acts well in certain forms of neuralgic pains, especially in tic douloureux. It appears to act less favourably in sciatica (*Imparziale*, No. 8, 1878).—*The Practitioner*, November 1878.

ERGOT IN ATONY OF THE BLADDER.—Professors Langenbeck and Israel state that they have obtained excellent results in certain cases of atony of the bladder with hypertrophy of the prostate by means of subcutaneous injections of ergot (12 centigrammes of the solution of Bonjau). The improvement was very marked after one, two, or three injections. A patient under the care of Israel, who was unable to retain his water for more than ten minutes, and who was thus treated, was able to hold it for three hours (*Gaz. des*

Hôp., Mars 2, 1878, and *Imparziale*, No. 9, 1878).—*The Practitioner*, November 1878.

THE TREATMENT OF HEAT APOPLEXY WITH ERGOT.—Dr Dedrickson has successfully treated several cases of sunstroke by means of ergot. The treatment consisted in the application of ice to the nape of the neck, and the administration of fifteen grains of liquid extract of ergot, and three minims of tincture of aconite every hour. The ordinary remedy of the East in cases of this kind is twenty grains of quinine; this was ineffectual in one of the cases in which the ergot proved beneficial. If the coma has advanced so far that the patient cannot be made to swallow, Dr Dedrickson suggests that ergotine may be injected subcutaneously. The aconite is to be omitted if the action of the heart is weak (*Dubl. Jour. of Med. Science*, Oct. 1878).—*The Practitioner*, November 1878.

WHOOPING-COUGH.—Dr M. Mannheimer gives his treatment of nine cases of whooping-cough by intralaryngeal insufflations of a fine powder, composed of equal parts of sulphate of quinine and white chalk. Six of the cases were in the spasmodic stage, and three cases in the catarrhal stage. The ages of the patients varied from 4¾ to 16 years of age. The disease was entirely cured in from four to seven days, with one, or at most two, insufflations daily. The average duration of treatment in these nine cases was six days (*Chicago Medical Journal and Examiner*, August 1878).—*Detroit Lancet*, October 1878.

COTO BARK—ITS PROPERTIES.—Fronmüller condenses our present knowledge of this new drug. Like jaborandi, it is derived from the forests of Brazil. As found in the shops, it consists of irregular pieces, flat, or slightly curved, two or three metres in length, and eight to fourteen millimetres in thickness. Colour is brownish red, odour aromatic, taste acrid, somewhat bitter, neither slimy nor astringent.

Wittstein found as its chief constituents an ethereal oil, a volatile alkaloid, like propylamin or trimethylamin, smelling like herrings, and soft and hard resins.

Lobst has found in the bark some fifteen per cent. of a crystallizable substance, called cotoin, derived from ethereal maceration, and having the composition of $C_{21}H_{20}O_6$. It crystallizes from water in light pale yellow four-sided prisms. The taste of these is biting and their reaction neutral. It dissolves slightly in cold water and easily in hot.

Dr Dietel, of Munich, has clinically used the bark and a tincture of it. He concludes that in this form it is a specific in diarrhœa.

Burhart and Riecher, from experiments with cotoin, reached similar conclusions.

Franmüller has used coto in some two hundred cases of various diseases, of which ninety-three suffered with colliquative diarrhœa and ninety-one from sweating of the same grave character. In most cases the diarrhœa was checked and good stools obtained. Large doses gave the best results. Coto has the advantage over other remedies used in diarrhœa in that it *improves* the appetite. A medium dose of the tincture (1 part of bark to 9 of 85 per cent. alcohol) is 50 drops thrice daily (*Wien. Med. Presse.—Phil. Med. Times*, 28th Sept. 1878).—*Detroit Lancet*, October 1878.

ATROPIA IN COLLAPSE.—Dr J. T. Hodgen, of St Louis, has for the last twelve years used atropia in collapse, and has found it an admirable remedy, having used it in cases of collapse in malarial fevers, also in collapse from strangulation of the intestine, and many times in cholera. In sixteen cases of cholera, all in profound collapse, blue, cold, shrivelled, and pulseless, some with rapid, irregular, and difficult breathing, the following practice was pursued —Dr Hodgen injected into the areolar tissue from one-sixtieth to one-thirtieth of a grain of atropine. In four cases there was no perceptible effect, the patients all dying in from three to sixteen hours. In two cases within an hour the pulse became perceptible and distinct, the skin warm, even red; one of these died in eight, the other in fourteen hours. In three cases reaction was pretty well established within an hour after the injection of atropine, but all three died. Seven of the sixteen patients treated with atropine recovered, six of them rapidly and completely. In one case of the six the patient took by injection half a pint of the infusion of buchu, one ounce of buchu with half an ounce of common salt to the gallon, every half-hour for twenty-four hours. During this time, though the tea was retained, she had three dark bilious evacuations, having taken a large quantity of calomel. The kidneys acted freely, and twenty-four hours after Dr Hodgen first saw her no one would have supposed she had had cholera, so complete was the recovery. The seventh case did not recover so promptly. This was an exceedingly sensitive, nervous woman, of strong will, who determined not to die. This case responded promptly to one-fortieth of a grain of atropine. Water was allowed as a drink, and warm water and sometimes beef-tea injected into the bowels. After two relapses atropine was injected for the third time, and the pulse responded. Urine was discharged abundantly, and the patient recovered rapidly. Atropine diminishes the irritability of the spinal cord, produces a rapid contraction of the engorged vessels of the conjunctiva, and stimulates the action of the sympathetic. The injection of saline solutions into the bowels is sufficiently indicated by the loss sustained by the blood. Dr Hodgen does not believe atropine will *cure* any case of cholera, but he believes its judicious use will so relieve the congestion consequent upon the action of choleraic poison, that remedies may be introduced into the system;

that we are enabled to replace the lost serum of the blood by the best substances known to us, and that in cases where the poison has already been eliminated and the patient is in danger of death from simple exhaustion, so that this affords us an opportunity of supplying the waste, and thus saving the patient (*St Louis Med. and Surg. Journal*, May 1878).—*The Practitioner*, Nov. 1878.

CAMPHOR IN CASES OF LOSS OF SLEEP.—In cases of melancholia with anxiety, camphor often exhibits a sleep-producing quality when all other means have failed. Dr Wittich administers 1–2 decigrammes of camphor tinct. internally, or he injects the same dose in a solution of 1·0 tinct. camphor in 10·0 ol. amygd. The injection is hypodermic, and a somewhat wider canula than the ordinary is required. No evil effects follow its use (*Berliner Klin. Wochensch.* 1878, No. 11).—*The Practitioner*, Nov. 1878.

APOMORPHIA AS AN EMETIC IN CASES OF OBSTRUCTION OF THE ŒSOPHAGUS.—M. Verger administered two hypodermic injections of apomorphia to a child who had swallowed a plumstone, which stuck in the œsophagus, and in whom ipecacuanha had failed to excite vomiting. The two injections represented a total dose of 2·5 milligrammes. Vomiting quickly occurred, and the foreign body was expelled. The child soon fell asleep, presenting evidence of muscular prostration and slight loss of intellectual power. The pulse was small, the respiration normal. Administration of coffee restored the child to its ordinary condition (*Arch. Gén. de Méd.*, Oct. 1878).—*The Practitioner*, Nov. 1878.

PERISCOPE OF OTOLOGY.

By J. J. KIRK DUNCANSON, M.D., C.M., F.R.C.P., and F.R.S., Edinburgh, Surgeon to the Ear Dispensary, 6 Cambridge Street, Lothian Road; Assist.-Surgeon, Eye Infirmary; Lecturer on Diseases of the Ear, Edinburgh School of Medicine.

THERAPEUTICS OF THROAT DISEASES.—General treatment is always specially indicated when the throat affection is symptomatic of any general malady. Scrofula, phthisis, or syphilis, for example, or when it occurs in the course of a continued fever, of one of the exanthemata, of diphtheria, or as a result of zymotic influences. In other cases also a constitutional diathesis must be combated concurrently with the local trouble. *Pigments for Internal Application.*—These can only be applied by the patients themselves to the pharynx and anterior—by some to posterior—nares. For application to the pharynx aqueous solutions are the best. If it be desired that the substance should remain long in contact with the part, it will be found better to mix it with bismuth and starch, or mucilage, than with glycerine. Undiluted preparations of glycerine are very irritating in all catarrhal conditions of mucous passages, owing to the peculiar attraction of glycerine to water. For applications to the nares, mixtures of vaseline will be found very useful; this substance is absorbed by the nasal mucous membrane, while oils and unguents are not. All pigments should be applied with brushes. It is, as a rule, much more difficult to apply solutions accurately with a sponge, though many excellent practitioners use a piece of sponge secured in a suitable holder, employing a fresh bit for each patient. Dr Smyly, of Dublin, instead of a brush uses aluminium handles, bent to a curve, round which he twists a piece of cotton-wool, using a fresh piece for each patient. Either of these materials is very suitable for pharyngeal, and especially for nasal applications, and under certain circumstances is preferable for diseases of a contagious nature. In the case of children, where the use of the brush, or of any instrument, is a matter of difficulty, it will be found a good plan to wrap a piece of lint round the index finger, as this can often be inserted where a brush or a sponge could not. Pigments may be used for their antiseptic, astringent, sedative, solvent, or stimulant action.—*A Practical Guide for Diseases of the Throat.* By Lennox Browne. 1878.

THE LONDON DEAF AND DUMB DEBATING SOCIETY.—An animated debate took place in the Lecture Hall on Wednesday last, the 9th inst., on the question: "Is the Indian Government justified in going to war with Afghanistan?" It was opened by one of the Vice-Presidents, Mr M. Cant, who spoke in favour of the war, and the Hon. Secretary, Mr E. South, who argued against it. Five or six speakers followed, and the result of the votes was 33 ayes and 5 noes, thus approving the policy of the Government.—*The Graphic*, 19th Oct. 1878, page 391.

We have since learned from communication with Mr E. South, Hon. Secretary, that the debates are carried on in the "Finger and Sign Language." The debate of Wednesday the 23d inst. was regarding the question, "What is the greatest necessity for the Social and Intellectual Advancement of the Deaf and Dumb?" The unanimous answer to the question was, "Constant and extensive reading, and intercourse with hearing persons." The new oral system "was condemned in strong terms, and would not cause any difference in the general condition of the deaf and dumb."—29th Oct. 1878.

THE LADIES' CHRISTIAN HOMES FOR DEAF AND DUMB CHILDREN, at 74 Pentonville Road and 1 Victoria Park Square, have proved so valuable in the north and east of London that it is greatly wished to establish similar homes in the west and south of the metropolis, and funds are thus urgently needed. These homes are intended to admit those poor children who can be taught by the system of the school board, but live too far away to attend the schools. The children are accordingly boarded from Monday till riday, but it is now proposed to take as permanent boarders such af and dumb children as have no proper homes, in order to ach them on the oral system. Donations to be sent to the Rev. . Stainer, treasurer, Avenue House, Gow Road, Victoria Park, ; or to Mr W. J. H. Yates, Assistant Secretary, 74 Pentonville oad.—*The Graphic*, 9th November 1878, p. 483.

The most remarkable feature of the meeting was the opening ldress by the president, M. Nadault de Buffon, who is also blind, nd a nephew of the great naturalist. After thanking the inister of the Interior for honouring the Congress with his resence, and for his philanthropic efforts in behalf of his blind ompanions, M. Nadault de Buffon dwelt on the necessity of ndividual initiative, and pointed out the advantages enjoyed in ountries where this quality is put into practice, and he hoped n universal association would be organized for the protection of he blind.—*British Medical Journal*, 26th October 1878, p. 648, Paris Letter.

DEAF AND DUMB SCHOOL, BERLIN, 1806. *Saturday, 1st March.*—Went with Mr Frere and Mr Mansfield to the Institution for the Deaf and Dumb under the direction of Professor Escke. There are twenty-one pupils, the greater proportion boys, two or three girls only. The Professor seems an intelligent man, and fully adequate to the business of instruction. There is always too great a fondness for exhibition at these places, and the effect of the performance is in some degree diminished by the suspicion of elaborate preparation. However, these children exhibited great proofs of being well taught; they could read, write, and even speak tolerably well; they repeated not only what the master said, but could understand and answer the questions put to them by others. It appears that the sense of sight is principally exercised and depended on. To show how completely deaf they are, the master employed an instrument invented at Paris, made of wood, in the shape of a horse-shoe, and hollow; the two extremities are turned, and can be inserted into the external ears; the sound of the voice is prodigiously increased when any words are spoken into this mouthpiece, yet none of these children could hear what was said in the slightest degree. Their sight was so quick that they could understand any short sentence dictated by any one of us strangers, and written in the air by the master, at the opposite end of the room; and even one of the boys could write down what the master said, although he spoke with his hands covering his mouth. Their pronunciation was so articulate that he made them repeat each of our names. Some syllables are learned by putting the finger or hand against the throat and tongue. One of the pupils is become an assistant-teacher. Some well-executed drawings done by different boys were shown, and some paintings done at the porcelain manufactory. In the dark they can communicate their thoughts to each other by writing on their backs, or upon the palms of the hands. I inquired whether they could understand each other by putting the hands upon the lips of the person who speaks, but I was not quite satisfied with the answer of the master. The children appeared well taken care of, and were very gay. Those who were in the best health, who had the strongest organs of speech, could articulate much more distinctly, and with greater ease, than the weak and delicate, to which class the majority of children seem to me to belong, from what I have observed in such institutions. This establishment is in part supported by the king and partly by the payment from the scholars. We were loaded with a quantity of books, the manufactured articles of Germany; no less than six different books were put into our hands, and we paid something more than two dollars for them, as a sort of gift to this useful and most charitable institution.—*Journal of a Residence at Vienna and Berlin in the Eventful Winter* 1805–1806. By the late Henry Reeve, M.D. Edinburgh. 1803. Published by his Son. 1877.

THE BLIND CONGRESS AT PARIS.—The Congress which has just concluded its sittings at Paris, to consider the best means of improving the condition of the blind, is not the least interesting of those which have been held in connexion with the Paris Exhibition. The proportion of the blind to the seeing in Western Europe is about 1 in 1000; but although this proportion may seem small, the actual number of blind is considerable, being about 30,000 in England, 40,000 in France, etc. Putting philanthropy aside, it is a matter of great national importance that these people should receive the kind of education which will fit them to add something to the national wealth and wellbeing. The first question discussed was the best system of embossed printing, and this was decided nearly unanimously in favour of the Braille system, which has this great recommendation, that it is easily *written*, and that such writing is extremely legible by touch. Indeed the Congress in this decision has done little more than record the fact that there is scarcely a blind institution in Europe, and few in other parts of the world, where this excellent educational system is not more or less used. The next most important question decided was, that the best mode of educating the numerous blind children who cannot gain admission into institutions, is to establish day-schools where they may learn the best methods of education by touch, while at the same time they should be encouraged to attend ordinary schools for the seeing. This plan has long been followed by the Indigent Blind Visiting Society of London, and has been found to work very well. A third decision arrived at was the desirability of forming a society in France similar in scope to the British and Foreign Blind Association, which has already shown how much may be done towards promoting better methods of education. It is well occasionally to pause and see what progress has been made in any particular subject; and such congresses are useful in drawing public attention to matters which are a little removed from ordinary observation.—*The Graphic*, 19th Oct., page 403.

OCCASIONAL PERISCOPE OF DERMATOLOGY.

By W. ALLAN JAMIESON, M.D., F.R.C.P., Lecturer on Diseases of the Skin, Edinburgh School of Medicine.

ON THE USE OF VASELINE AND UNGUENTUM VASELINI PLUMBICUM IN SKIN DISEASES.—Professor Kaposi, after stating that all emollient substances hitherto used in diseases of the skin, where the epidermis is removed or the surface is sensitive,—as various fatty substances, oils, lard, glycerine, and glycerine of starch, are more or less irritating in most cases,—refers to the bland and non-irritating properties of vaseline or petroleum jelly (with this also may be classed ozokerin and unguentum petrolei). These have no tendency to become rancid, and are useful in softening and removing crusts and scales, as in cases of eczema squamosum when the surface is dry and desquamating. He introduces an ointment which promises to prove of great value. This is a modification of Hebra's well-known unguentum diachyli, which is seldom met with properly prepared except at Vienna. This ointment, for which Kaposi proposes the name of unguentum vaselini plumbicum, is made by dissolving and incorporating thoroughly by aid of heat equal parts of lead plaster and vaseline, to which a little oil of bergamotte may be added to scent. It causes no burning sensation on excoriated parts, and is especially available in eczema. It is admitted by Kaposi that the original unguentum diachyli gave rise to unpleasant heat and even acute exacerbations of the eczema, due, he believes, to an evolution of fatty acids from the oil during boiling, and to an imperfect saponification of the oxide of lead.—*Wiener Medical Wochenschrift*, xxviii. 17. 1878.

OLEATE OF ZINC IN THE TREATMENT OF ECZEMA.—Dr Crocker recommends this as most useful in both acute and chronic eczema in its discharging stage. It is prepared by stirring together one part of oxide of zinc by weight with eight fluid ounces of oleic acid as free from palmitic acid as possible, and, after letting it stand for two hours, heating it till the zinc is completely dissolved. This, when cold, can be made into an ointment by mixing with one part of vaseline. It is applied spread on linen rags kept in close contact with the part. Before each dressing the old ointment is to be wiped off.—*Brit. Med. Journal*, 26th October 1878.

ON THE INOCULABILITY OF CERTAIN AFFECTIONS OF THE SKIN.—M. Vidal, as the result of a series of observations, finds that all varieties of ecthyma are inoculable both on those already affected and on the sound. The resulting pustule runs through the same stages as the primary, but its power of reproduction ceases after about the fifteenth inoculation. Both impetigo contagiosa and ordinary impetigo are inoculable. Herpes (febrilis) is inoculable, but only in rare cases. Epidermic pemphigus of infants is inoculable, but pemphigus dintinus is doubtfully so, and eczema and herpes zoster are not.—*Revue des Sciences Medicales,* 15th October 1878.

ERUPTION AFTER CANNABIS INDICA. — Dr Hyde, of Chicago, reports (*Medical Record,* 11th May 1878) an interesting case of universally disseminated vesicular efflorescence appearing the morning after an evening dose of this drug, one grain having been given. The vesicles varied from a pin-point in size to a small split pea. It was accompanied by very slight itching, and by a marked dermatitis. The eruption subsided in a few days without bursting, leaving a light desquamative crust of yellowish red hue.—*Boston Medical and Surgical Journal,* 13th June 1878.

ECZEMA PRODUCED BY OXYURIDES.—Michelson reports the case of a child, 13 years old, who complained of itching in the inguinal region, which was found to be the seat of an impetiginous eczema marginatum, suggesting the presence of trichophyton. The centre of the eruption presented a moist surface covered with little red points, and with fœtid debris of macerated epidermis. Microscopic examination revealed not a vegetable parasite, but the eggs of the oxyuris in various stages of development. It is probable that the worms were attracted from the rectum to the parts prepared for the reception and development of their eggs by the heat and moisture of the eczematous skin. Cure was rapidly effected by warm baths and a lotion of salicylic acid.—*Berliner Klinische Wochenschrift,* 1877, No. 33.

AUSTRALIAN GUM TREES.—One of the Australian gum trees (*Eucalyptus globulus*) has been largely planted in North Africa and South Europe, as a remedy for malaria. Through its agency the ruin-dotted Campagna, some say, is once more to be thickly populated. The purifying influence streams from the leaves, being one of the volatile oils which make the air of the Australian bush so deliciously fragrant to the camped-out traveller, awakened to see the sun rise by the harsh and saucy-sounding cackle of the laughing jackass; but which, when the sun has attained his full strength, give to the atmosphere, where the scrub stands thick, somewhat of the oppressiveness of excessive incense.

The eucalyptus, which has found favour with European planters, is the Blue Gum, so called from the colour of its leaves, but four stand above it in the list of richness as oil-yielders.

First stands the Dandenong, or Narrow-leaved Peppermint (*E. amygdalina*), a tree which is known to have attained the height of 120 feet. Another measured eucalyptus was as high as the Great Pyramid, and it is supposed there are even loftier trees of the kind. Before these Titans were discovered, the greatest tree-giant known in Australia was a Karri 400 feet high, within whose hollow trunk three mounted men with a led horse could turn. It would seem, then, that even Californian pines are overtopped by Australian gum trees, and after such figures "as tall as the monument," sounds somewhat like "as big as a shrimp." As a timber tree, the Peppermint is chiefly useful for the construction of the gray railed fences with slip panels, which form so characteristic a feature of the landscape in settled and semi-settled Australia—a poor substitute, in a picturesque point of view, for our variously luxuriant hedges, which, I believe, have been reproduced in Tasmania. Coarse paper might be made from the inner bark of the Peppermint; its bark generally contains 20 per cent. of tannic acid, and it exudes a gum resin.

Next comes the Mallee tree (*E. oleosa*), a small tree, covering thousands of acres of what is called, from it, Mallee Scrub. It may be called a vegetable camel, its roots retaining so much water, that travellers through the wilderness rip them up for refreshment.

The Ironbark (*E. sideroxylon*) stands third. Its name explains itself. It might be called the rhinoceros of timber trees. The wood which its rugged bark covers is close-grained, greasy, and almost imperishable, and accordingly is used in ship-building, and for cog-wheels, spokes, shafts, and poles.

The White Gum (*E. goniocalyx*), which follows, is another giant, utilized by builders, and sometimes by coopers. Packing paper can be made from its bark, which yields about 18 per cent. of potash, its wood about 20 per cent.

Bloodwood (*E. corymbosa*) exactly ties Blue Gum as an oil-producer, each yielding 12·50 per cent. Its bark makes strong wrapping paper. Its wood is red (as might be inferred from the name) and of a good grain, but so thickly veined with resin that it is chiefly used for fuel.

The Blue Gum runs up to a height of 300 feet, half of the huge bole without a branch. House-builders, coach-builders, ship-builders, and civil engineers, make good use of it, and from its bark also paper can be made.

Stringybark (*E. fabrorum* or *obliqua*) is the next in order. It is a huge tree, occurring in vast numbers, and although it warps and (dry) rots readily, it is much used for fences and shingles, because it splits so easily. The black fellows make spear-strings out of its fibre. Printing paper and pasteboard can be made out of its bark, which is used for roofing bush huts.

Messmate (*E. fissilis*) yields a bush-carpenter's and wheel-wright's wood. The black fellows use it for spears.

Another Peppermint (*E. odorata*), on whose leaves the opossums feast, save for the oil in them, is not a very noteworthy tree. Woollybut (*E. Woollsii*) yields a hard, red, straight-grained timber.

The Red Gum (*E. rostrata*) is the common gum tree of Australia, growing plentifully along the banks of creeks and rivers. It yields a hard, red, curly-grained wood, almost as indestructible as that of the Jarrah, or Swan River mahogany, which defies wet, dry rot, and white ants. Its gum is prescribed for chronic diarrhœa.

The Manna Tree (*E. viminalis*) runs from 50 to 120 feet in height. The blacks make canoes and drinking vessels out of its bark, and shields out of its wood. Its leaves in early summer are covered with white manna, which falls like snow when the wind stirs them. Another kind of manna, the secretion of an insect, candies the leaves of a eucalyptus in the Mallee scrub. A delicious lemon-scented perfume is obtained from the leaves of *Eucalyptus citriodora*. An Australian town was for some years lighted with gas distilled from gum-tree leaves.

There are other eucalypti, amongst them the Box (*E. leucoxylon*), which yields a timber hard and greasy like the Ironbarks; the Gray Box (*E. dealbata*), very similar in its qualities; the Mountain Ash (*E. inophloia*), supposed to resemble its European name-giver; the Mountain White Gum Tree (*E. Gunnii*), which grows to a greater height on mountains than in plains; the Broad-leaved Box (*E. acmenoides*), and the Blackbut (*E. persicifolia*), which yields a timber like the Bloodwoods. Altogether, the gum tree has good right to be called the Australian oak, and can far more safely be introduced at random into an Australian picture than a palm tree into an Indian one.

The wedge-tailed eagle circles high even over its high head, and builds his nest within its forks. The silver and black little wood-duck splashes up from the winding creek to perch upon its branches, on which the drowsy nankeen night heron mopes, and the bronze-wing pigeon plants himself where the glowing sunshine can best fall upon his burnished wings.

High on the gum tree, also, the green thrush ever begins the sweet little song, which can find neither a middle nor an end; and between the gum tree and the ground bell-birds flutter up and down, ringing out their "ting-ting, ting-ting." The satin bower birds, when weary of their polite pranks in their curious nests, pay visits to the gum tree, and tiny spotted diamond sparrows dodge twittering about its boughs. The screaming, gorgeously plumaged blue mountaineer and the green paroqueet probe its yellow blossoms with their beaks. The red-shouldered paroqueet pecks on the ground beneath them, and glossy magpies and crows hop about silvery logs and felled and fallen monarchs of the forest, liquidly fluting, mellowly croaking.

The weird, arid, weary-eyed iguana writhes up the gum tree's bole; myriads of locusts clatter upon it in summer; rare butterflies flutter about it; in its hollows bees, wild, and run or flown wild, hide their rich stores of honey. In its hollows, also, the opossums make their homes; coming out after sunset, to scamper up and down, growling under their breath, or to make themselves, as they sit here and there upon the lofty boughs, blots of blackness on the gray-pearly moonlit sky.—Richard Rowe. *The Graphic*, 19th Oct. 1878. Page 398.

SPONTANEOUS AMPUTATION OF THE THIGH. By JOHN HARRIS, M.B., C.M., L.R.C.P. Edinburgh, etc., Honorary Surgeon to Newcastle Hospital.—W. J. N., aged 17, admitted into the Newcastle Hospital 4th Nov. 1876, with the following history:—A fortnight previously, whilst engaged felling timber at the Myall Lakes, a tree about two feet in diameter fell across the right thigh, fracturing it in the middle third. He was brought about a mile to his home, and an unqualified practitioner was brought from Clarence Town, who put up the fracture on a M'Intyre splint, and ordered cold water to be constantly applied to the limb.

Three days afterwards the lad's mother, noticing dark blisters appearing on the limb, as well as a disagreeable smell, sent for his attendant, who informed her that the leg was doing well, and the new skin would soon appear under the blisters. She waited for seven days, and the fœtid smell increasing, the patient was conveyed in a steam launch to Port Stephens, and thence in a ketch to Newcastle, where he arrived on the evening of 4th November. When admitted, the lad seemed to have suffered severely from the journey, and complained of great pain in the upper part of the thigh, which was tightly bandaged to the splint. On cutting the bandage, the leg and lower third of the thigh were found to be completely separated, and readily came away on my making slight traction. Upon examination of the stump, it was found that the whole of the skin and superficial structures on the posterior and lateral aspects had sloughed and partly separated as high as the great trochanter, leaving an irregular granulating surface of about twelve inches long by ten in width. There were two large fragments of bone lying across the end of the stump, and the end of the femur was projecting about two inches. The parts below the fracture were in an advanced state of decomposition. His pulse was 120, temperature 101°; countenance pinched, with hectic flush. A quarter of a grain of morphia was injected subcutaneously. About ten minutes after the removal of the leg he became partly insensible, with rigidity of the muscles and fixation of the lower jaw, which passed off as the morphia took effect.

No attempt was made to remove the fragments of bone, and the limb was dressed with carbolic oil. He was ordered quiniæ sulph. gr. iii. liq. ferri perchlor. gtt. xv. every three hours, with liberal diet and 8 oz. brandy. He improved rapidly, and in five days the loose fragments of bone were taken away. Sixteen d after admission, the protruding bone was cut down upon and r moved, leaving the wound to heal by granulation. The sup ficial wound had now reduced to half its former size. On 1 December he was discharged at his own request, the wound be then about four inches square. About three weeks afterwards returned, when the wound was found to be nearly healed. He since obtained an artificial limb, with which he is enabled to w very well. It would appear that in this case there was a compo comminuted fracture, probably also some injury to the bloodvess However, as the M'Intyre splint had neither padding nor any p vision to protect the soft tissues of the limb from injurious contac with it, such as any skilled person would have used, there can be very little doubt but that the sloughing of the soft parts originated in consequence of injudicious bandaging and the continuou pressure between the iron of the splint and the fleshy portion of the thigh: this was self-evident, as the superficial wound at the back of the thigh was actually the moulded impression of the edge of the thigh-piece of the splint. The theory of the unqualified practitioner as to sound skin forming beneath the gangrenous ble requires no comment. The recovery of the patient, notwithstanding his early treatment, is a remarkable instance of the *vis medicatrix naturæ*.—*Australian Practitioner*, No. 3, April 1878.

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